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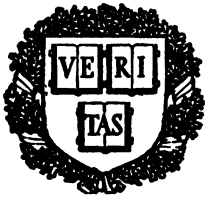

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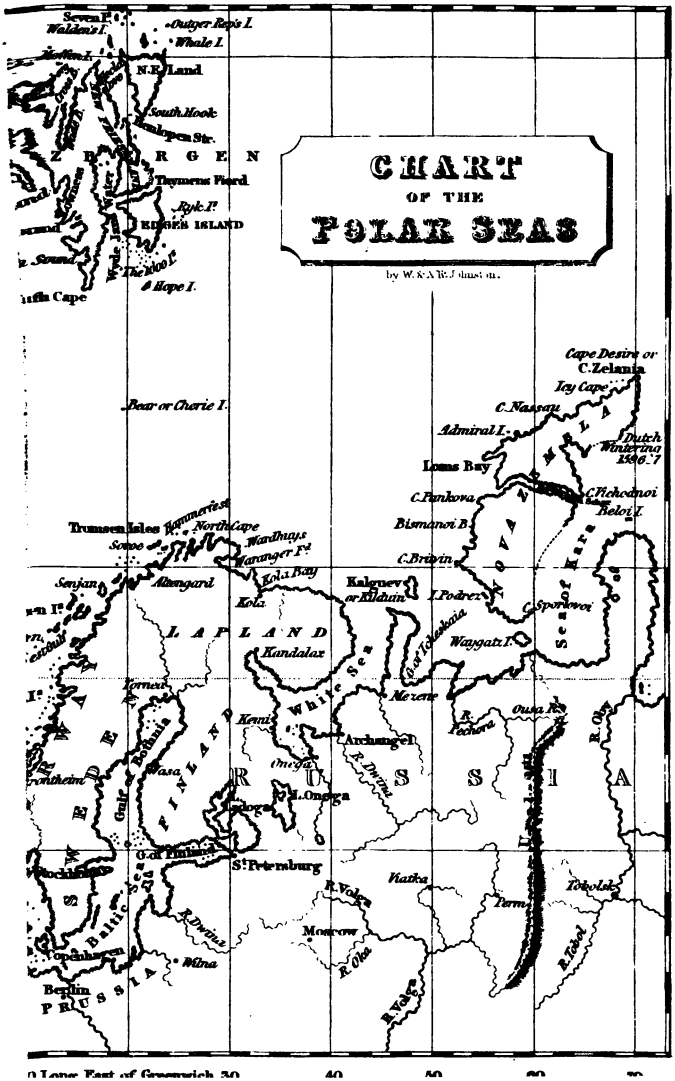
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DISCOVERY AND ADVENTURE

IN THE

POLAR SEAS AND REGIONS.

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NARRATIVE

OF

DISCOVERY AND ADVENTURE

IN THE

POLAR SEAS AND REGIONS:

WITH ILLUSTRATIONS OF THEIR

CLIMATE, GEOLOGY, AND NATURAL HISTORY;

AND AN ACCOUNT OF THE

WHALE-FISHERY.

BY SIR JOHN LESLIE, K. H.,
Professor of Natural Philosophy in the University of Edinburgh, and Corresponding Member of the Royal Institute of France;

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Regius Professor of Natural History in the University of Edinburgh; and

HUGH MURRAY, ESQ., F.R.S.E.

WITH A CHART AND FIFTEEN ENGRAVINGS.

FIFTH EDITION,

REVISED AND COMPLETED TO THE PRESENT TIME.

EDINBURGH:

OLIVER & BOYD, TWEEDDALE COURT;

AND SIMPKIN, MARSHALL, & CO., LONDON.

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TO

SIR JOHN BARROW, BART.,

LL.D., F.R.S., &c.

ONE OF THE SECRETARIES OF THE ADMIRALTY,

THE CHIEF PROMOTER OF DISCOVERY

IN THE

POLAR SEAS AND REGIONS,

THIS WORK IS,

(WITH PERMISSION,)

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PREFACE

TO THE FIFTH EDITION.

THE present Work was undertaken with the view of giving a complete and connected description of the varied phenomena of the Polar World, as well as an account of the more important voyages and expeditions, whether for profit or discovery, through which it has become known to Europe. Such a subject, it is believed, combining much that is interesting in natural scenery and maritime adventure, can hardly fail to prove attractive. In those climates, nature is marked by the most stupendous features, and presenting objects at once sublime and beautiful, the forms she assumes differ from her aspects in our milder latitudes almost as widely as though they belonged to another planet. The tempests and darkness of those wintry realms are strikingly varied by the brief but brilliant summer, the singular magnificence of the celestial and meteorological appearances, and the dreary grandeur of those enormous piles of ice which stud the land or float upon the water. Along with a characteristic range of vegetable productions, and a remarkable profusion of animal life wonderfully adapted to sustain existence in the extremity of cold, we are presented with a race of men singular alike from the circumstances to which they have conformed themselves, the manners and customs thence resulting, and the contrivances whereby they brave the

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utmost rigours of the clime. When, moreover, it is considered that in the field of Northern Discovery England laid the foundation of her maritime pre-eminence, and that the men who have earned in it the greatest glory were chiefly British, it will be admitted that the history of their adventures must have a peculiar charm for the English reader.

The Narrative of these Voyages has been carefully drawn from the most authentic sources by Mr Murray, whose labours in a similar department of literature have been already received by the public with no common approbation. They include the adventures and exploits of many of those navigators of whom their country has the greatest reason to be proud. Such in early times were Willoughby, Chancelor, Frobisher, Davis, Hudson; more recently Parry, Scoresby, Ross, the uncle and nephew, with others of little inferior note. The wild and strange scenes through which their career led, the peculiar perils with which it was beset, the hairbreadth escapes and sometimes tragical events that ensued, give to their narratives an interest similar to that of romance. They may serve, too, as introductory to a new one, which may erelong be expected from Sir John Franklin. That officer, so distinguished by his discoveries along the American coast, is preparing this spring (May 1845) to set sail on a fresh attempt to accomplish the long-sought-for north-west passage. Steering a somewhat northerly course, between Boothia and the Georgian Islands, he hopes to avoid the obstacles by which the two last expeditions of Parry and Ross were arrested.

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Besides these narratives, several of the most distinguished men of science in Scotland lent their aid to illustrate the wonderful order of nature prevailing within the Arctic Circle. Sir John Leslie commenced the volume with a full examination of the Climate and its Phenomena,—subjects so important as they respect those high latitudes, that without a preliminary knowledge of them the progress of discovery would be but imperfectly understood. A general survey of all that is known regarding the Geological Structure of the same interesting regions has been given by Professor Jameson.

The chapter on Natural History, though the subject be treated by Mr Murray in a popular rather than in a scientific manner, has received the careful revision of a distinguished naturalist.

The whale-fishery forms a striking feature in Arctic adventure, and is, besides, of great national as well as commercial importance. Of its daring operations and its various perils, the description here introduced may be the more acceptable, as it is presumed to be the only one hitherto attempted within a moderate compass. The account of the Trade itself, which has been prepared with the utmost possible accuracy, is brought down to the very latest period.

For an account of the successive expeditions, by land or along the coast, to define the northern boundaries of the American and Asiatic continents, the reader is referred to the Ninth Number of our series, which is devoted to the "PROGRESS OF DISCOVERY ON THE MORE NORTHERN COASTS OF AMERICA." In that volume are

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contained interesting descriptions of the wild country through which the different travellers penetrated to the shores of the Polar Sea, of the sufferings they endured, and of the valuable additions made by them to geographical science. The knowledge of these facts is in some degree necessary to a clear comprehension of the objects contemplated in the more recent voyages under Parry and Ross; and the latter, by reaching the American coast through the Arctic Ocean, has connected together the subjects of the two volumes, rendering them, in truth, parts of one work, and each necessary to the illustration of the other.

EDINBURGH, *March* 1845.

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POLAR SEAS AND REGIONS

CHAPTER I.

The Climate of the Polar Regions.

General View of the Subject—Light thrown on it by Voyages of Discovery—Various Opinions and Observations discussed—Distribution of Heat over the Surface of the Globe—Currents in the Atmosphere—Freezing of the Arctic Sea—Phenomena of the Seasons in the Polar Regions—Formation of Icebergs—Changes in the Aspect of the Polar Seas—Supposed Alterations in the Climate of Europe—State of the Ice in the Polar Seas—Situation of the Ancient Colonies in Greenland.

The climate and seasons within the Arctic circle exhibit most peculiar and striking features, which modify in a singular manner the whole aspect of nature. An investigation of those phenomena seems therefore necessary for enabling the reader to comprehend the narrative, and to follow through such icy regions the paths of the daring navigator. Accordingly, in order to elucidate the subject more fully, it will be proper to give some explication of the principles that regulate generally the distribution of heat over the surface of our globe.

Many of the facts relative to the Polar climate have been collected in the course of the bold and arduous attempts made to penetrate to India across the northern seas. Projects of this kind, after being long suspended,

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were in 1818 renewed, and embraced with excessive ardour by the English government. For two or three years previous to that date, the captains of ships employed in the northern whale-fishery had generally concurred in representing the Arctic Sea as of a sudden become almost open and accessible to the adventurous navigator. By the more speculative relaters, it was supposed that the vast icy barrier, which for many ages had obstructed those dreary regions, was at last, by some revolution of our globe, broken up and dispersed. The project of finding a north-west passage to Asia,—a project so often attempted and so long abandoned,—was by consequence again revived; and the more daring scheme of penetrating to the Pole itself had likewise been seriously proposed. Of the complete success of either plan the hopes of sober thinkers were indeed extremely slender; yet the prospect held forth seemed to be more inviting, on the whole, than at any former period when such bold undertakings were attempted. The discovery of a north-west passage, were it ever attainable, could hardly, it is true, be of any real benefit to our commerce; since in such high latitudes, where alone it could be found, it would at all times be very precarious, and liable to interruption from the prevalence of ice. The scheme of actually reaching that northern point on the surface of our globe which terminates its axis of rotation, however interesting in a philosophical view, can only be regarded as an object of pure curiosity, and not likely to lead to any useful or practical results. Yet was it befitting the character of a great maritime nation to embrace every chance of improving geographical knowledge, as well as of extending the basis of natural science; and accordingly, about sixty years ago, the Board of Admiralty resolved to fit out an expedition for the express purpose of exploring the Arctic Ocean.

The books and memoirs which contained the latest accounts of the state of the northern seas, either suggested the enterprise then pursued, or were brought

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forward in consequence of its adoption. The Honourable Daines Barrington, a man of learning and some ingenuity, embraced with ardour the opinion of those who believed that it was possible to reach the Pole. In successive papers, communicated to the Royal Society of London, he not only condensed the information furnished by the older voyagers, but exhibited the results of the numerous queries relating to the same object, which he had circulated among persons engaged in the Greenland fishery. He thence proved, that, in certain favourable seasons, the Arctic Seas are for several weeks so open that intrepid navigators might safely penetrate to a very high latitude. In compliance with his sanguine representations, the Admiralty in 1773 despatched Captain Phipps to explore those regions; but this commander was unsuccessful in the attempt, having reached only the latitude of 80½ degrees, when his ship got surrounded by a body of ice near Spitzbergen, and escaped with extreme difficulty, though many of the whalers had in that summer advanced farther. Mr Barrington did not, however, despair; and, following out his views, he induced Mr Nairne and Dr Higgins to make experiments on the congelation of sea-water. The various facts were collected in a small volume, to which Colonel Beaufoy subjoined an appendix containing the answers made to his queries by Russian hunters (who are accustomed to spend the whole year in Spitzbergen), relative to the probability of travelling from that island to the Pole during winter, in sledges drawn by rein-deer. The reports of these hardy men were sufficiently discouraging. They pictured the winter at Spitzbergen as not only severe but extremely boisterous, the snow falling to the depth of three or five feet, and drifting so much along the shores by the violence of the winds as often to block up all communication. The danger of being surprised and overwhelmed by clouds of snow, raised in sudden gusts, was so great that they never ventured to undertake any long journeys over the ice. Nor did they think it at all practicable

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to have loaded sledges dragged over a surface so rough and hilly by the force of rein-deer or dogs.

At a recent period, the speculations of Mr Scoresby presented more than ordinary claims to attention, as exhibiting the conclusions of a diligent, accurate, and scientific observer. Trained from infancy to the navigation of the frozen seas under the direction of his father, a most enterprising and successful leader, he conjoined experience with ingenuity and judgment. For several years, during the intervals of his Greenland voyages, he prosecuted a regular course of study at the University of Edinburgh, which, enriching his mind with liberal attainments, gave a new impulse to his native genius and ardour. It was exceedingly to be regretted, that any jealousies or official punctilios should have prevented government from intrusting the principal command of the Polar expedition to him who not only proposed it originally, but whose talents and science, joined to his activity, perseverance, and enthusiasm, afforded assuredly the best promise of its ultimate success.

Hans Egede, a benevolent enthusiast, formed a plan of reclaiming the natives of Greenland from the errors of Paganism. After various ineffectual attempts, he at last procured by subscription, in Denmark, the sum of £2000, with which he purchased a vessel, and carried his family and forty settlers to Baal's River, in the 64th degree of north latitude, where he landed on the 3d of July 1721. He was afterwards appointed missionary, with a small salary, by the Danish government, which occasionally granted some aid to the colony. During his stay, which lasted till 1736, he laboured with great zeal in his vocation. In 1757, the year before his death, he printed his *Description of Greenland*, in the Danish language, at Copenhagen. A translation of that work, much improved and enlarged, with useful additions by the editor, contains valuable information, tinged with a large portion of credulity.

It is remarkable that two centuries of extreme ac-

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tivity should have added so little to our knowledge of the Arctic regions. The relations of the earlier navigators who sailed to those parts possess an interest which has not been yet eclipsed. The voyage of Martens from Hamburg to Spitzbergen may be cited as still the most instructive. But the best and completest work on the subject of the northern fisheries, is a treatise in three volumes octavo, translated from the Dutch language into French by Bernard de Reste, and published at Paris in 1801, under the title *Histoire des Pêches, des Découvertes et des Etablissemens des Hollandais dans les Mers du Nord.*

The Arctic expedition, which in 1818 attracted the attention of the public, proposed two distinct objects, —to advance towards the Pole, and to explore a north-west passage to China. These were no doubt splendid schemes; but, in order to form a right estimate of the plan and some anticipation of its probable results, it was necessary to proceed with caution, and to employ the lights of science. The facts alleged, respecting the vast islands or continents of ice recently separated and dispersed from the Arctic regions, gave occasion to much loose reasoning, to wild and random conjectures, and visionary declamation. Glowing anticipations were confidently formed of the future amelioration of climate, which would scarcely be hazarded even in the dreams of romance. Every person possessing a slight tincture of physical science conceives himself qualified to speculate concerning the phenomena of weather, in which he feels a deep interest; and hence a very flimsy and spurious kind of philosophy, however trifling or despicable it may appear in the eyes of the few who are accustomed to think more profoundly, gained currency among certain classes of men, and engendered no small share of conceit. Meteorology is a complex science, depending on so many subordinate principles that require the union of accurate theory with a range of nice and various observations as to have advanced very slowly towards perfection.

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With regard to the nature and real extent of the change which had taken place in the condition of the icy seas, the reports were no doubt greatly exaggerated. To reduce them to their just amount, it would be necessary to estimate the annual effects produced in those regions, and likewise to compare the observations of a similar kind made by experienced navigators at former periods. From a critical examination of the various facts left on record, it will perhaps appear that the Arctic Seas have been more than once, in the course of the last half-century, as open as they are now represented.

To discuss with accuracy the question of the periodical formation and destruction of the Polar ice, it becomes necessary to explain the true principles which regulate the distribution of heat over the globe. This I shall attempt to perform, independently of every hypothesis, by a direct appeal to experiment and observation.

If at any place we dig into the ground, we shall find, by the insertion of a thermometer, that as we successively descend we approach constantly to some limiting temperature, which under a certain depth continues unchanged. The point of this equilibrium varies in different soils, but seldom exceeds thirty or fifty feet. If the excavation be made about the commencement of winter, the temperature will appear to increase in the lower strata; but on the contrary, if the pit be formed in the beginning of summer, it will be found to grow colder in proportion as we descend.* Hence it is manifest that the mass of the earth transmits very slowly the impressions of heat or of cold received at its surface. The external temperature of any given day will perhaps take nearly a month

* In the dreary climate of Hudson's Bay, it is remarked by the residents, that, even during the summer months, in digging through the ground for a grave, they always come at the depth of a few feet to a stratum of frozen earth.—A singular feature of the remoter Arctic tracts is the frequent appearance of *red snow*. This deception is occasioned by the interspersed multitudes of minute plants, now termed *Protococcus Nivalis*, a species of *Algæ*, which penetrate to a great depth through the snow, and vegetate in the severest weather.

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to penetrate one foot into the ground. By digging downwards in summer we soon reach, therefore, the impressions of the preceding spring and winter; but the same progress into the ground brings us back to the temperatures of the autumn and of the summer. Still lower, all the various fluctuations of heat become intermingled and confounded in one common mean.

Such observations are more easily and correctly made, by having thermometers, with long stems, sunk to different depths in the ground; and, from an extensive register, we may conclude that the temperature of the ground is always the mean result of the impressions made at the surface during a series of years. The successive strata, therefore, at great depths, may be regarded as permanent records of the average state of the weather in distant ages. Perhaps the superficial influence will scarcely descend fifty feet in the lapse of a century. Copious springs, which percolate the bowels of the earth and rapidly convey the impressions of subterranean heat to the surface, will consequently furnish the most accurate reports of the natural register of climate. These, if rightly chosen, differ not sensibly in their temperature at all seasons; and, whether they have their seat at a depth of one hundred or of five hundred feet, they affect the thermometer alike.* We are hence entitled to conclude, that however the weather may have varied from year to year, or changed its character at intervals of short

* The celebrated fountain of Vaucluse, situated in the latitude of 43° 55′, and 360 feet above the level of the Mediterranean Sea, has been observed to acquire its highest temperature about the first day of September, and to reach the lowest at the beginning of April; the former being 56°.3, and the latter 54°.1, by Fahrenheit's scale; which gives 55°.2 for its mean heat. The waters are collected from the fissures of an extensive limestone rock, and seem to receive the superficial impressions in the space of three months. They burst forth with such a volume as to form, only a few yards below their source, the translucid Sorgue, a river scarcely inferior, in the quantity of its discharge, to the Tay above the town of Perth.

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periods of years, it has yet undergone no material alteration during the lapse of many ages.

Some philosophers attempt to explain such facts as are now stated, from the supposed internal heat of the globe, caused by the action of central fires; and pretend, in support of their favourite hypothesis, that the temperature always increases near the bottom of very deep mines. But this observation holds only in particular situations, where the warm exhalations from the burning of lamps and the breathing of the workmen are collected and confined under the roofs of the galleries. In the case of an open pit the effect is quite reversed, the bottom being always colder than the mean temperature. This is owing to the tendency of the chill air to descend by its superior density. The superficial impressions of heat and cold are thus not sent equally downwards; so that the warmth of summer is dissipated at the mouth of the pit, while the rigours of winter are collected below. A similar modification of temperature occurs in deep lakes, in consequence of the disposition of the colder and denser portions of the water always to sink down.

The permanent heat of the ground is, therefore, produced by the mere accumulation of external impressions received, either directly from the sun's rays, or circuitously through the medium of atmospheric influence. But air is better fitted for diffusing than for storing up heat. The whole mass of the atmosphere, it may be easily shown, does not contain more heat than a stratum of water only ten feet thick, or one of earth measuring fifteen feet. According to their relative temperature, the winds, in sweeping along the ground, either abstract or communicate warmth. But the sun is the great and original fountain of heat, which the internal motion excited in the atmosphere only serves to distribute more equally over the earth's surface. The heat imparted to the air, or to the ground, is always proportional to the absorption of the solar beams; and hence the results are still the same, whether we embrace the simple theory,

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that heat is only the subtile fluid of light in a state of combination with its substratum, or prefer the opinion that light has always conjoined with it a certain admixture of the invisible matter of heat.

Owing to the spherical form of the earth, and the obliquity of its axis, very different quantities of light or heat are received in the several latitudes. The same portion of heat, which would raise the temperature of 135 pounds of water a degree on Fahrenheit's scale, is only capable of melting one pound of ice. The measure of ice dissolved is therefore the simplest and most correct standard for estimating the quantity of heat expended in that process. If we apply calculation to actual experiment, we shall find that the entire and unimpaired light of the sun would, at the Equator, at the mean latitude of 55°, and at the Pole, respectively, be sufficient to melt a thickness of ice expressed by 38.7, 25.9, and 13.4 feet. Of this enormous action, the greatest portion is no doubt wasted in the vast abyss of the ocean; and, of the remainder, a still larger share is perhaps detained and dissipated in the upper atmosphere, or projected again in a soft phosphorescence. Yet the light which, after those diminutions, finally reaches the surface of the earth, if left to accumulate there, would create such inequality of temperature as must prove quite insupportable.

The slow-conducting quality of the ground, if not altered by extraneous influence, would fix the heat where it was received, and thus perpetuate the effect of the unequal action of the sun's beams. The mobility of the atmosphere hence performs an important office in the economy of nature, as the great regulator of the system, dispensing moderate warmth, and attempering the extremities of climate over the face of the globe. As the heat accumulates within the tropics, it occasions currents of cold air to rush from the higher latitudes. But the activity of the winds thus raised, being proportional to their exciting cause, must prevent it from ever surpassing certain limits. A perpetual commerce of heat

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between the Poles and the Equator is hence maintained by the agency of opposite currents in the atmosphere. These currents often have their direction modified; and they may still produce the same effects, by pursuing an oblique or devious course. The actual phenomena of climate only require the various winds, throughout the year, to advance southwards or northwards at the mean rate of about two miles an hour, or to perform in effect three journeys of transfer annually from the Equator to either Pole. Not that these currents carry the impressions of heat or cold directly from one extremity of the globe to the other, but by their incessant play they contribute, in the succession of ages, to spread them gradually over the intervening space.

The system of opposite aërial currents leads to the same law of the gradation of temperature in different latitudes, as the celebrated Professor Mayer of Göttingen deduced from an empirical process.* It would appear that the variation of the mean temperature at the level of the sea is always proportional to the sine of twice the latitude. Thus, for the parallels of every five degrees, the arrangement is simple: —

Latitude.	Mean Temperature.	Latitude.	Mean Temperature.
0°	84°	50°	53°.5
5°	83°.8	55°	49°.2
10°	82°.4	60°	45°.0
15°	80°.7	65°	41°.3
20°	77°.9	70°	38°.1
25°	74°.9	75°	35°.5
30°	70°.9	80°	33°.6
35°	67°.0	85°	32°.4
40°	62°.4	90°	32°
45°	58°.0		†

* This proposition admits of a mathematical demonstration, but which is too intricate for the present discourse.

† Perhaps the gradation of temperature would, in the higher latitudes, require a small modification. Instead of assuming 32° as the medium at the Pole, it might be more exact to adopt 28°, or the melting-point of the ice of sea-water. But the re-

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The arithmetical mean, or 50°, corresponds to the middle latitude of 45°; but the real mean of the temperature over the whole surface of the globe is 67°, which should occur on the parallel of 35° 51½′

It thus appear, that the system of currents maintained in the atmosphere contributes essentially, by its unceasing agency in transferring and dispersing heat, to prevent the excessive inequality of seasons in the higher latitudes. But the motions produced in such a vast mass of fluid must evidently follow, at long intervals, the accumulated causes which excite them. Hence probably the origin of those violent winds which, succeeding to the sultry warmth of summer and the sharp frosts of winter, prevail in the months of September and March, and are therefore called by seamen the *Equinoctial Gales*. In the Arctic Seas nature has made a further provision for correcting the excessive irregularity of the action of the sun's rays. This luminary, for several months in winter, is totally withdrawn from that dreary waste; but, to compensate for his long absence, he continues during an equal period in summer to shine without interruption. Now, from a beautiful arrangement, the surface of the ocean itself, by its alternate freezing and thawing, presents a vast substratum,

cent voyagers have registered the coldness in advancing northwards as much more intense. It is evident, however, that their thermometrical observations must have been affected by some latent and material inaccuracy. Were the mean temperature of the Arctic regions really below the point of saline congelation, the annual formation of ice in those seas would exceed the quantity dissolved, and therefore the extension of the frozen fields would, contrary to fact, be constantly progressive. This argument appears to be quite conclusive; though some attempts are made to elude its force, by alleging that thick blocks of ice, transmitting the impressions of cold with extreme slowness, may confine and exasperate the atmospheric rigours. But ice conducts like water near the freezing-point, when this fluid conveys the external influence of heat and cold as a solid mass, unassisted by the translocation of its particles, which can occur only in the case of sensible expansions. The formation and dissolution of ice are therefore similar acts, that contribute equally to mitigate the vicissitudes of the Arctic climate.

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on which the excesses of heat and of cold in succession are mutually spent. In ordinary cases, the superficial water, as it cools and therefore contracts, sinks down into the abyss by its superior gravity; but when it grows warmer it expands, and consequently floats incumbent, communicating afterwards its surplus heat with extreme slowness to the mass below. But the seas within the Arctic circle being always near the verge of congelation, at which limit water scarcely undergoes any sensible alteration of volume even from a considerable change of temperature, the superficial stratum remains constantly stagnant, and exposed to receive all the variable impressions of the sweeping winds. The piercing cold of winter, therefore, spends its rage in freezing the salt water to a depth proportional to its intensity and continuance.* The prolonged warmth of summer, again, is consumed in melting those fields of ice, every inch of which in thickness requiring as much absorption of heat as would raise the temperature of a body of water 10½ feet thick a whole degree. The summer months are hence nearly gone before the sun can dissolve the icy domes, and shoot with entire effect his slanting rays. It may be shown, that under the Pole the action of the solar light is, at the time of the solstice, one-fourth part greater than at the Equator, and sufficient in the course of a day to melt a sheet of ice an inch and a half thick.

If horizontal winds serve to balance the unequal action of the solar beams over the surface of the globe, the rising and descending currents excited in the body of the atmosphere still more effectually maintain the equilibrium of day and night. After the ground has

* At Melville Island, in the latitude of 74° 45′, Captain Parry observed ice to form, of a thickness from three to five inches, around the ship's sides in the space of twenty-four hours; and in one instance it gained in that time the thickness of 7½ inches, Fahrenheit's thermometer being then 12° below zero. Such power of congelation, it might be computed, would require the full refrigerating action of a stratum of air, at that temperature, rather more than a mile in height.

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become heated by the direct illumination of the sun, it warms the lowest portion of the incumbent air, which, being thus dilated, begins to ascend, and therefore occasions the descent of an equal portion of the fluid. But these vertical currents, being once created, will continue their motion long after the primary cause has ceased to impel them, and may protract, during the night, the accumulation of chilled air on the surface of the earth. This effect is further augmented, in general, by the frigorific impressions which are at all times darted downwards from a clear sky.* By the operation of this combined system, therefore, the diurnal vicissitudes of heat and cold are diminished in the temperate and torrid zones. Another consequence results from such rapid and continual interchange of the higher and lower strata, that the same absolute quantity of heat must obtain at every altitude in the atmosphere.

But this equal distribution of heat at all elevations is modified by another principle, which causes the regular gradation upwards of a decreasing temperature. In fact, air is found to have its capacity or attraction for heat enlarged by rarefaction; so that any portion of the fluid carried to the higher regions, where it by consequence expands, will have its temperature proportionally diminished. The decrease of temperature in ascending the atmosphere, to moderate heights, is not far from being uniform, at the rate of about one degree on Fahrenheit's scale for every hundred yards of elevation.†

* See Supplement to the Encyclopædia Britannica, vol. iii. part i. p. 177; or Transactions of the Royal Society of Edinburgh, vol. viii. part ii. p. 465.

† It should be remarked, however, that at great elevations the law of equal decrements of heat suffers a considerable deviation. In the higher regions of the atmosphere the decrease of temperature advances proportionally faster. Such is the conclusion drawn from some nice experiments, and confirmed by a comparison of numerous actual observations. It may be sufficient to notice here a few distinct results. Thus, while at the level of the sea the mean temperature of the air or the land is, in the tropical regions, one degree colder for each hundred yards of ascent, it suffers the same decrease at the elevation of one mile for every 92 yards, at two miles for 85

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Hence the limit of perpetual congelation forms a curve, which is nearly the same as the *Companion of the Cycloid*, bending gradually from the Equator, reverting its inflexure at the latitude of 45°, and grazing the surface at the Pole. The mean heights of eternal frost, under the Equator, and at the latitudes of 30° and 60°, are repectively 15207, 11484, and 3818 feet.

It is important to remark, that the heat of large collections of water seldom agrees precisely with the mean temperature corresponding to the latitude. The variable impressions received at the surface from the atmosphere will not, as on land, penetrate slowly into the mass, and become mingled and equalized at a moderate depth. Heat is conducted through liquids chiefly by the internal play resulting from their partial expansion. In the more temperate regions of the globe, the superficial waters of lakes or seas, as they grow warmer, and, therefore, specifically lighter, still remain suspended by their acquired buoyancy. But whenever they come to be chilled they suffer contraction, and are precipitated by their greater density. Hence the deep water, both of lakes and of seas, is always considerably colder than what floats at the surface. The gradation of cold is distinctly traced to the depth of twenty fathoms, below which the diminished temperature continues nearly uniform as far as the sounding-line can reach. In shallow seas, however, the cold substratum of liquid is brought nearer to the top. The increasing coldness of water, drawn up from the depth of only a few fathoms, may hence indicate to the navigator who traverses the wide ocean his approach to banks or land.

These principles, however, do not apply to the peculiar circumstances of the Arctic Seas. Water differs essentially, in its expansion by heat, from mercury, oil,

yards, at three miles for 78 yards, at four miles for 72 yards, and at five miles, the highest summit perhaps of our globe, the decrement of a degree for 66 yards. Within the Arctic circle the gradation of cold, in ascending the atmosphere, must be decidedly more rapid.

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or alcohol: Far from dilating uniformly,—a property which fits the latter substances for the construction of thermometers,—it swells from the point of congelation, or rather a very few degrees above it, with a rapid progression to that of boiling. Near the limit of its greatest contraction, the volume of water is scarcely affected at all by any alteration of heat. When the surface of the ocean is depressed to a temperature between 28 and 44 degrees of Fahrenheit's scale, it remains almost stagnant, and therefore exposed to the full impression of external cold. Hence the Polar Seas are always ready, under the action of any frosty wind, to suffer congelation. The annual variations of the weather are in those seas expended on the superficial waters, without disturbing the vast abyss below. Contrary to what takes place under milder skies, the water drawn up from a considerable depth is often warmer within the Arctic circle than what lies on the surface. The floating ice accordingly begins to melt generally on the under side, from the slow communication of the heat sent upwards.

These deductions are confirmed by the results of the nicest astronomical observations. Any change in the temperature of our globe would occasion a corresponding change of volume, and consequently an alteration in the momentum of the revolving mass. Thus, if from the accession of heat the earth had gained only a millionth part of linear expansion, it would have required an increase of five times proportionally more momentum to maintain the same rotation. On this supposition, therefore, the diurnal revolution would have been retarded at the rate of three seconds in a week. But the length of the day has certainly not varied one second in a year since the age of Hipparchus; for we cannot imagine that the ancient observations of eclipses could ever deviate an hour, or even 3000″, from the truth. We may hence conclude, that in the lapse of three thousand years the mass of our globe has not acquired the ten-millionth part of expansion,—an effect which

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the smallest fraction of a degree of heat would have communicated.

The accumulation of ice on the surface of the ocean would likewise have occasioned a prolongation of the length of the day. This alteration would no doubt be diminished under the Arctic circle, from the proximity of the glacial protuberance to the axis; but its influence would still cause an appreciable difference.

After the continued action of the sun has at last melted away the great body of ice, a short and dubious interval of warmth occurs. In the space of a few weeks, visited only by slanting and enfeebled rays, frost again resumes its tremendous sway. Snow begins to fall as early as August, and the whole ground is covered to the depth of two or three feet, before the month of October. Along the shores and bays the fresh water, poured from rivulets or drained from the thawing of former collections of snow, becomes quickly converted into solid ice. As the cold augments the air deposits its moisture in the form of a fog, which freezes into a fine gossamer netting or spicular icicles, dispersed through the atmosphere and extremely minute, that might seem to pierce and excoriate the skin. The hoar-frost settles profusely, in fantastic clusters, on every prominence. The whole surface of the sea steams like a limekiln,—an appearance called the *frost-smoke*, caused, as in other instances of the production of vapour, by the water's being still relatively warmer than the incumbent air. At length the dispersion of the mist, and consequent clearness of the atmosphere, announce that the upper stratum of the sea itself has cooled to the same standard; a sheet of ice spreads quickly over the smooth expanse, and often gains the thickness of an inch in a single night. The darkness of a prolonged winter now broods impenetrably over the frozen continent, unless the moon chance at times to obtrude her faint rays, which only discover the horrors and wide desolation of the scene. The wretched settlers, covered with a load

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of bear-skins, remain crowded and immured in their hut, every chink of which they carefully stop against the piercing cold; and, cowering about the stove or the lamp, they seek to doze away the tedious night. Their slender stock of provisions, though kept in the same apartment, is often frozen so hard as to require to be cut by a hatchet. The whole of the inside of their hut becomes lined with a thick crust of ice; and if they happen for an instant to open a window, the moisture of the confined air is immediately precipitated in the form of a shower of snow. As the frost continues to penetrate deeper, the rocks are heard at a distance to split with loud explosions. The sleep of death seems to wrap up the scene in utter and oblivious ruin.*

At length the sun reappears above the horizon;† but his languid beams rather betray the wide waste than brighten the prospect. By degrees, however, the farther progress of the frost is checked. In the month of May the famished inmates venture to leave their hut, in quest of fish on the margin of the sea. As the sun acquires elevation his power is greatly increased. The snow gradually wastes away,—the ice dissolves apace,—and vast fragments of it, detached from the cliffs, and undermined beneath, precipitate themselves on the shores with the crash of thunder. The ocean is now unbound,

* "The sound of voices which, during the cold weather, could be heard at a much greater distance than usual, served now and then to break the silence which reigned around us; a silence far different from that peaceable composure which characterizes the landscape of a cultivated country; it was the death-like stillness of the most dreary desolation, and the total absence of animated existence."—PARRY. During the winter at Melville Island, people were heard conversing at the distance of a mile. This was no doubt owing partly to the density of the frigid atmosphere, but chiefly to the absence of all obstruction in a scene of universal calm and darkness.

† In the Arctic regions, the atmosphere being highly condensed by the intensity of the cold, the horizontal refraction is much augmented, which causes the sun to reappear several days sooner than might be expected from the latitude. This curious and cheering effect was first remarked by the unfortunate Hollanders who wintered at Spitzbergen in 1596.

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and its icy dome broken up with tremendous rupture. The enormous fields of ice, thus set afloat, are, by the violence of wind and currents, again dissevered and dispersed. Sometimes, impelled in opposite directions, they approach and strike with a mutual shock, like the crash of worlds,—sufficient, if opposed, to reduce to atoms, in a moment, the proudest monuments of human power. It is impossible to picture a situation more awful than that of the crew of a whaler, who see their frail bark thus fatally enclosed, expecting immediate and inevitable destruction.

Before the end of June, the shoals of ice in the Arctic Seas are commonly divided, scattered, and dissipated. But the atmosphere is then almost continually damp, and loaded with vapour. At this season of the year, a dense fog generally covers the surface of the sea, of a milder temperature indeed than the frost-smoke, yet produced by the inversion of the same cause. The lower stratum of air, as it successively touches the colder body of water, becomes chilled, and thence disposed to deposit its moisture. Such thick fogs, with mere gleams of clear weather, infesting the northern seas during the greater part of the summer, render their navigation extremely dangerous. In the course of the month of July, the superficial water is at last brought to an equilibrium of temperature with the air, and the sun now shines out with a bright and dazzling radiance. For a certain time before the close of the summer, such excessive heat is accumulated in the bays and sheltered spots, that the tar and pitch are sometimes melted, and run down the ships' sides.

Notwithstanding the shortness of the summer in the high latitudes, the air on land becomes often oppressively sultry. This excessive heat, being conjoined with moisture, engenders clouds of mosquitoes, from the stings of which the Laplanders are forced to seek refuge in their huts, where they envelop themselves in dense smoke. Humidity marks the general character of the Arctic regions, which are covered during the greater

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part of the year with chilling fogs. The sky seldom appears clear except for a few weeks in winter, when the cold at the surface becomes most intense. Yet the rigour of that season is not felt so severely as the thermometer would indicate. When the temperature is lowest the air is commonly calm, and therefore abstracts less heat from the body than the exposure to a strong wind of much inferior coldness. The providence of the natives serves to mitigate the hardships they have to suffer. The Esquimaux, on the approach of winter, cut the hard ice into tall square blocks, with which they construct regular spacious domes, connected with other smaller ones, for the various purposes of domestic economy. They shape the inside with care, and give it an even glossy surface by the affusion of water. The snowy wall soon becomes a solid concrete mass, which, being a slow conductor, checks the access of cold, while it admits a sufficient portion of light. It may also be remarked, that the external darkness prevails only during a part of the day. Since twilight obtains whenever the sun is less depressed than 18 degrees below the horizon, the limits of entire obscuration occur in the latitudes of $84\frac{1}{2}°$ and $48\frac{1}{2}°$; in the former at mid-day in the winter solstice, and in the latter at midnight in the solstice of summer. Between these extremes the atmosphere at the opposite seasons glows, to a greater or a less extent, from the middle of the day or of the night. Accordingly, Captain Parry's party, during their detention at Melville Island, in the latitude of 74° 40′, found that, in clear weather about noon, they could easily, in the depth of winter, read the smallest print on deck. This position corresponds to the alternating parallel of 58° 20′, which nearly reaches Orkney, where the transparency of the nights in the height of summer is well known.* The approach of twilight is, besides,

* This view of the subject deserves perhaps more elucidation. The inhabitant of a temperate climate may hence form a better conception of the progressive glimmer of an Arctic winter. In a high northern latitude the dusky glow at noon in mid-winter

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advanced in the frozen regions by the superior refractive power of a very dense atmosphere. The horizontal refraction usually raises the lower limb of the sun and moon about the twelfth part of their diameters, and often gives it a wavy and fantastic outline. Hence the reappearance of those luminaries is hastened within the Arctic circle, though the quantity of anticipation has been much exaggerated.

The ice which obstructs the navigation of the Arctic Seas consists of two very different kinds; the one produced by the congelation of fresh, and the other by

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exactly resembles the summer twilight in some corresponding latitude farther south. Let L and *l* denote the two northern latitudes, D and *d* the north or south declination of the sun; then will the depression of this luminary below the horizon be expressed in winter by *d*+L—90°, and in summer by 90°—D—*l*. Assuming 23½° for D and *d*, the depressions at the solstitial points will be respectively L—66½° and 66½°—*l*; and consequently reckoning the limit of darkness when the sun is 18° below the horizon, L—66½°=18°, and 66½°—*l*=18°, and L=84½°, and *l*=48½°, being the latitudes where the gleam at midday in winter and the twilight at midnight in summer first appear. But in general, the latitudes of equal obscurity or illumination are evidently included in the simple formula L+*l* =133°. Hence this equivalent table:—

84½°	48½°
85°	48°
86°	47°
87°	46°
88°	45°
89°	44°
90°	43°

At the Pole, therefore, it is as dark at noon in the depth of winter as it is at midnight in the summer solstice at the latitude of 43°.

But a modification may possibly be required. We should probably come nearer the truth to assume, as the limit of darkness, a depression of 20° for the Arctic regions (where the horizontal refraction is so much increased by excessive cold), and only 16° for the milder climates. The table would then stand thus:—

86½°	50½°
87°	50°
88°	49°
89°	48°
90°	47°

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that of salt water. In those inhospitable tracts, the snow, which annually falls on the islands or continents, being again dissolved by the progress of the summer's heat, pours forth numerous rills and limpid streams, which collect along the indented shores, and in the deep bays enclosed by precipitous rocks. There this clear and gelid water soon freezes, and every successive year supplies an additional investing crust, till, after the lapse perhaps of several centuries, the icy mass rises at last to the size and aspect of a mountain, commensurate with the elevation of the adjoining cliffs. The melting of the snow, which is afterwards deposited on such enormous blocks, likewise contributes to their growth; and by filling up the accidental hóles or crevices, it renders the whole structure compact and uniform. Meanwhile the principle of destruction has already begun its operations. The ceaseless agitation of the sea gradually wears and undermines the base of the icy mountain, till at length, by the action of its own accumulated weight, when it has perhaps attained an altitude of a thousand or even two thousand feet, it is torn from its frozen chains, and precipitated, with a tremendous plunge, into the abyss below. This mighty launch now floats like a lofty island on the ocean; till, driven southwards by winds and currents, it insensibly wastes and dissolves away in the wide Atlantic.

Such I conceive to be the real origin of the icy mountains or *icebergs*, entirely similar in their formation to the *glaciers* which occur on the flanks of the Alps and the Pyrenees. They consist of a clear, compact, and solid ice, having the fine green tint verging to blue, which ice or water, when very pure and of a sufficient depth, generally assumes. From the cavities of these icebergs, the crews of the northern whalers are accustomed, by means of a *hose* or flexible tube of canvass, to fill their casks easily with the finest and softest water. Of the same species of ice, the fragments which are picked up as they float on the surface

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Icebergs.

of the ocean yield the adventurous navigator the most refreshing beverage.*

It was long disputed among the learned, whether the waters of the ocean are capable of being congealed; and many frivolous and absurd arguments, of course, were advanced to prove the impossibility of the fact. But the question is now completely resolved; and the freezing of sea-water is established both by observation and experiment. To congeal such water of the ordinary saltness, or containing nearly the thirtieth part of its weight of saline matter, it requires not an extreme cold: this process taking effect about the 27th degree

* The water which flows from those Arctic glaciers becomes frozen again on the approach of winter, and forms along the coast a thick stratum of blue solid ice, embedded in the beach, and from six to ten feet under the surface.

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on Fahrenheit's scale, or only five degrees below the freezing-point of fresh water. The product, however, is an imperfect sort of ice, easily distinguishable from the result of a regular crystallization: it is porous, incompact, and imperfectly diaphanous. It consists of spicular shoots, or thin flakes, which detain within their interstices the stronger brine; and its granular spongy texture has, in fact, the appearance of congealed syrup, or what the confectioners call *water-ice*. This saline ice can, therefore, never yield pure water; yet, if the strong brine imprisoned in it be first suffered to drain off slowly, the loose mass that remains will melt into a brackish liquid, which in some cases may be deemed drinkable.*

While icebergs are the slow growth of ages, the fields or shoals of saline ice are annually formed and destroyed. The ice generated from melted snow is hard, pellucid, and often swells to an enormous height and dimensions. But the concretion of salt water wants solidity, clearness, and strength, and never attains to any very considerable thickness. It seldom floats during more than part of the year; though, in some cold seasons, the scattered fragments may be surprised by the early frost, and preserved till the following summer.

The whale-fishers enumerate several varieties of the salt-water ice. A very wide expanse of it they call a *field*, and one of smaller dimensions a *floe*. When a field is dissevered by a subaqueous or *grown* swell, it breaks into numerous pieces, seldom exceeding forty or fifty yards in diameter, which, taken collectively, are termed a *pack*. This pack again, when of a broad shape, is called a *patch*; and, when much

* Captain Parry remarked, that the superficial water near melting ice had scarcely any trace of saltness. In other observations made about the end of July, he discovered the water at the surface to contain only the 550th part of its weight of salt; but under ten fathoms the proportion had increased to the 39th, and at the depth of 300 fathoms to the 37th part. The friable ice of sea-water was found to hold the 115th part of salt.

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elongated, a *stream*. The packs of ice are crowded and heaped together by violent winds; but they again separate and spread asunder in calm weather. If a ship can sail freely through the floating pieces of ice, it is called *drift-ice*, and is said to be *loose* or *open*. When, again, from the effect of abrasion, the larger blocks are crumbled down into minute fragments, this collection is called *brash-ice*. A portion rising above the common level is termed a *hummock*, being produced by the squeezing of one piece over another. These hummocks or protuberances break the uniform surface of the ice, and give it a most diversified and fantastic appearance. They are numerous in the heavy packs, and along the edges of ice-fields, reaching to the height of thirty feet. The term *sludge* is applied by the sailors to the soft and incoherent crystals which the frost forms when it first attacks the ruffled surface of the ocean. As these increase, they have some effect, like oil, to still the secondary waves; but they are prevented from coalescing into a continuous sheet by the agitation which still prevails; and they form small discs, rounded by continual attrition and scarcely three inches in diameter, called *pancakes*. Sometimes these again unite into circular pieces, perhaps a foot thick, and many yards in circumference.

The fields and other collections of floating ice are often discovered at a great distance, by that singular appearance on the verge of the horizon, which the Dutch seamen have termed *ice-blink*. It is a stratum of lucid whiteness, occasioned evidently by the glare of light reflected obliquely from the surface of the ice against the opposite atmosphere. This shining streak, which looks always brightest in clear weather, indicates, to the experienced navigator, 20 or 30 miles beyond the limit of direct vision, not only the extent and figure, but even the quality of the ice. The *blink* from packs of ice appears of a pure white, while that which is occasioned by snow-fields has some tinge of yellow.

The mountains of hard and perfect ice are the gradual

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production, perhaps, of many centuries. Along the western coast of Greenland, prolonged into Davis' Strait, they form an immense rampart, which presents to the mariner a sublime spectacle, resembling at a distance whole groups of churches, mantling castles, or fleets under full sail. Every year, but especially in hot seasons, they are partially detached from their bases, and whelmed into the deep sea. In Davis' Strait those icebergs appear the most frequent; and about Disco Bay, where the soundings exceed 300 fathoms, masses of such enormous dimensions are met with, that the Dutch seamen compare them to cities, and often bestow on them the familiar names of Amsterdam or Haerlem. They are carried towards the Atlantic by the current which generally flows from the north-east, and after they reach the warmer water of the lower latitudes they rapidly dissolve, and finally disappear, probably in the space of a few months.

The blocks of fresh-water ice appear black as they float, but show a fine emerald or beryl hue when brought up on the deck. Though perfectly transparent like crystal, they sometimes enclose threads or streamlets of air-bubbles, extricated in the act of congelation. This pure ice, being only a fifteenth part lighter than fresh water, must consequently project about one-tenth as it swims on the sea. An iceberg of 2900 feet in height would therefore, after it floated, still rise 200 feet above the surface of the water. Such, perhaps, may be considered as nearly the extreme dimensions. Those mountains of ice may even acquire more elevation at a distance from land, both from the snow which falls on them, and from the copious vapours which precipitate and congeal on their surface. But in general they are carried forwards by the current which sets from the north-east into the Atlantic, where, bathed in a warmer fluid, they rapidly waste and dissolve. It may be shown by experiment, that if the water in which they float had only the temperature of 42°, the mass of ice would lose the thickness of an inch every

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hour, or two feet in a day. Supposing the surface of the sea to be at 52°, the daily diminution of thickness would be doubled, and would therefore amount to four feet. An iceberg having 600 feet of total elevation would hence, on this probable estimate, require 150 days for its dissolution. But the melting of the ice would be greatly accelerated if the mass were impelled through the water by the action of winds. A velocity of only a mile in an hour would triple the ordinary effect. Hence, though large bodies of ice are often found near the banks of Newfoundland, they seldom advance farther, or pass beyond the 48th degree of latitude. Within the Arctic regions those stupendous blocks remain, by their mere inertia, so fixed on the water, as commonly to serve for the mooring of vessels employed in the whale-fishery. In such cases, however, it is a necessary precaution to lengthen the cables, and ride at some distance from the frozen cliff; because the fragments of ice, which the seamen term *calves*, are frequently detached from the under part of the mass, and, darting upwards, acquire such a velocity in their ascent, that they would infallibly strike holes into the ship's bottom.

The ice produced from salt-water is whitish, porous, and almost opaque. It is so dense, from the quantity of strong brine enclosed in its substance, that when floating in the sea, it projects only one-fiftieth part above the surface. The porous saline ice has a variable thickness, yet seldom exceeding six feet, and which, though during the greater part of the year it covers the Arctic Seas, is annually formed and destroyed; a small portion only, and at certain seasons, escaping the general wreck. The thaw commonly lasts about three months; and during that time the heat of the solar rays, which, though oblique, yet act with unceasing energy, whether applied directly or through the intervention of the air or the water, is sufficient for the dissolution of all the ice produced in the course of the autumn, the winter, and the spring. It may be proved by experiment that, under

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the Pole itself, the power of the sun at the solstice could, in the space of a week, melt a stratum of five inches of ice. We may hence fairly compute the annual effect to be sufficient for thawing to the depth of forty inches. It should likewise be observed, that, owing to the prevailing haziness of the atmosphere in the northern latitudes, there can scarcely exist those singular cold emanations which always dart from an azure sky, and in the more temperate climates diminish the calorific action of the sun often by one-fifth part. On this account, perhaps, the estimate of the annual destruction of Polar ice may be raised to a thickness of four feet.

As heat is absorbed in the process of thawing, so it is again evolved in the act of congelation. The annual formation and destruction of ice within the Arctic circle is thus a beautiful provision of Nature for mitigating the excessive inequality of temperature. Had only dry land been there opposed to the sun, it would have been absolutely scorched by his incessant beams in summer, yet pinched during the darkness of winter by the most intense and penetrating cold. None of the animal or vegetable tribes could have at all supported such extremes. But in the actual arrangement the surplus heat of summer is spent in melting away the ice; and its deficiency in winter is partly supplied by the influence of the progress of congelation. As long as ice remains to thaw, or water to freeze, the temperature of the atmosphere can never vary beyond certain limits. Such is the harmony of the system; and all experience and observation confirm the belief that it is not subject to any radical change. Some years may chance to form more ice than others, or to melt more away; but it were idle to expect any thing like a general or permanent disruption of the glacial crust which binds the regions of the north. Even were this ice once removed, a similar collection would soon succeed, since it is always the effect, and not the cause, of the disposition of the atmosphere, which it really serves to temper. We should be guilty of the most vicious reasoning in a circle, if we

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maintained that ice first cooled the air, and that this cold air next increased the fields of ice.

But, whatever be the vicissitudes of the Polar ice, they cannot, in any sensible manner, affect the climates of the lower latitudes. The whole circumjacent space where frost holds his reign bears a very small proportion to the surface of the northern hemisphere. Reckoning from the parallel of sixty degrees, it would not exceed the eighth part; but, since the gelid region hardly extends below the latitude of seventy-five degrees, it may be stated at the thirty-second part of the hemisphere. On the supposition, therefore, that the Arctic cold were all transferred and infused into the atmosphere of the south, it would yet produce no perceptible alteration of climate.

Even if we imagined with Mr Scoresby, that, during the years 1816 and 1817, two thousand square leagues of ice disappeared in the Greenland Seas between the parallels of seventy-four and eighty degrees, this extent would still scarcely exceed half the surface of Ireland. It may be calculated, that the loss of heat on our globe, occasioned by a total eclipse of the sun, reckoning this only equivalent to a complete obscuration for the space of a single hour, is as much as would be absorbed by the thawing of a circle of ice 500 miles in diameter and 150 feet thick. This quantity surpasses at least sixty times the ice-fields dispersed from Greenland, allowing them the mean thickness of thirty feet; and yet the temperature of the air is never depressed more than a degree or two during the continuance of any solar eclipse.

But the idea is quite chimerical, that any winds could ever transport the Polar influence to our shores. It may be proved, from the results of accurate experiment, that a current of air flowing over a warmer surface, whether of land or water, becomes, in the space of an hour, penetrated with the same temperature through a stratum of eighty feet; though the limit of actual contact, or of mutual attrition, is confined to a surface not exceeding the 500th part of an inch in thickness. If we assign to

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it the height of a mile, which is a most ample allowance, it would lose all its sharpness, and acquire the standard heat in the course of sixty-six hours. Admitting this wind to travel at the rate even of twenty miles each hour, it would consequently spend all its frigorific action in a tract of 1320 miles. The gales from the remotest north must thus discharge their store of cold into the German Sea or the Atlantic Ocean. Nor could such impressions, though continued through a course of ages, have the smallest power to chill the superficial water; for the moment any portion of this was cooled, it would, from its increased density, sink down into the vast abyss. The surface would not be affected till after the cooling had, in its progress, pervaded the whole mass from the bottom upwards. According to the calculations of Laplace, founded on a comparison of the theory of tides with actual observation, the mean depth of the ocean exceeds ten English miles. Supposing, therefore, a wind blowing from some northerly point, and ten degrees colder than the water, were to sweep over the Atlantic six months every year, at the rate of fifteen miles an hour, it would take 220 years to abstract from that vast body of water a single degree of heat.*

Some persons have imagined that the mountains or islands of ice, which are occasionally drifted into the Atlantic Ocean, must be sufficient, by their frigorific influence, to modify the character of our climate. One of the first who advanced that opinion was the ingenious Richard Bradley, fellow of the Royal Society, and professor of botany in the University of Cambridge. In "A Survey of the Ancient Husbandry and Gardening, col-

* It is true that Laplace, on reviewing his intricate analysis, reduced successively the measure he had assigned for the mean depth of the ocean, without coming to any precise conclusion. But even supposing it were only five miles, or equal to the elevation of the highest mountains, the continued and absolutely concentrated action of the northern winds during more than a century would still be required, though counteracting causes were excluded, to cool down the mass of the Atlantic one degree.

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lected from the Greek and Roman Writers," printed in octavo at London in 1725, he introduces the following remarkable passage :—

"I the rather mention the case of winds becoming cold by mixing with the effluvia of snow or ice, because I have made some remarks upon the tempestuous weather, which often happens about the end of May, or in June, which has in all my observations been brought in by westerly winds; and again, I as surely find, that at such times large islands of ice and snow are passing to the southward in the Western Ocean, as I have been informed by several captains of ships that were then coming from our plantations to England. Some of these islands are so large as to measure sixty miles in length, and yielding so great a vapour, that for a day's voyage on one side of them, the weather has been so hazy that the mariners could not discover what they were; and this was accompanied with so much cold, that they imagined they had mistaken in their accounts, and got several degrees too far towards the north; but a day or two explained the matter, and gave them an opportunity of surveying what they had been so much surprised at. Now, considering the extraordinary heat of the sun at the season these appear, the vapour must be very considerable that rises from them, and it is no wonder then, that, as it expands itself, it presses the air with violence enough to cause tempests and carry cold along with it."

But a little reflection will convince us that such remote influence on our climate must be quite insignificant. At a very wide estimation, the surface of ice exposed to the winds could never exceed the thousandth part of the whole expanse of the Atlantic Ocean; consequently the general temperature of the air would not be altered the fortieth part of a degree. Nor could this minute impression be wafted to our shores, being invariably spent in the length of the voyage. The opinion which Mr Bradley entertained more than a hundred years ago might have been tolerated in the infancy of physical

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science; but that the same notion should be revived, and proclaimed with confidence at this day, may well excite surprise.

These reasonings, which suggested themselves on the sailing of the first expedition sent by government to explore the Arctic Seas, have been singularly confirmed by the results of the late daring voyages. Captain Parry, by the most vigilant exertions indeed, succeeded, during the brief interval of an open season, to advance from Baffin's Bay, by Lancaster Sound, above 400 miles westwards, through floating masses of ice, on the parallel of 75 degrees; but this distance is probably not the third part of the whole space between the Atlantic and Pacific Oceans. All the subsequent attempts of that able navigator to penetrate any farther in the same direction proved unsuccessful; and his last laborious effort to reach the Pole, by dragging boats over an expanse of rough and broken ice, completely failed. The utmost exertions of the crews scarcely enabled him to proceed, in 1827, three degrees northward from Spitzbergen, and attain the latitude of 82° 45′, not far beyond the usual resort of the Greenland whalers. Captain Weddell, without any stimulant of national reward, had, four years previously, the resolution to penetrate to a very great height in the opposite hemisphere, which is always considered colder and less accessible than the northern, having advanced to the latitude of 74° 15′ in an open sea.

On the hypothesis that the quantities of ice which encumber the Arctic Seas have been accumulating for a long succession of years, it is assumed as a fact, that throughout Europe a milder and more genial climate had formerly prevailed. A closer inspection of the details, however, will show this supposition to be destitute of any solid support. One hears continual complaints, indeed, of the altered condition of the seasons, especially from elderly persons, whose bodily frame has become more susceptible to the impressions of cold; but similar

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lamentations have been repeated by the poets and the vulgar from the earliest times. If we listened implicitly to such querulous declaimers, we should believe that Nature has spent all her fires, and is hastening fast into decay. Immense forests, it is said, anciently clothed the highest tracts of this island and other northern countries, where scarcely a tree can now be made to grow. The period of vintage was in former ages several weeks earlier in France than at present; vineyards were planted during the time of the Romans in various parts of the south of England, where at this day even the hop-plant is raised with difficulty; and the sides of many hills in Scotland bear evident traces of the plough, which have been long since abandoned irretrievably to the dusky heath.

But, in answer to such allegations, it may be observed, that a patch of wood will not thrive in cold situations, merely for want of the shelter which is afforded by extensive plantations. In Sweden and Norway, which are mostly covered with natural forests, it has become an object of police to prevent their indiscriminate destruction. The timber in those sylvan countries is cut at stated periods of its growth, and in detached portions; the vacant spaces being left as nurseries, embosomed amidst an expanse of tall trees. Some places in Sweden, where the forests have been accidentally destroyed by fire, present the image of sterility and of wide desolation.

It is probable that the vines grown in ancient times were coarser and hardier plants than those which are now cultivated. A similar observation extends to all the products of gardening. A succession of diligent culture softens the character of the vegetable tribes, and renders them more delicate, while it heightens the flavour of the fruit. The Roman soldiers stationed in Britain would naturally prefer wine, their accustomed beverage, however harsh and poor, to the *cervisia*, or unpalatable ale brewed by the rude natives.

The marks of tillage left on our northern hills prove only the wretched state of agriculture at a remote period.

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For want of a proper system of rotation, and the due application of manure, the starving tenantry were then tempted to tear up with the plough every virgin spot they could find, and, after extracting from it a pitiful crop or two of oats, to abandon it to a periodical sterility. The cattle in those days, having no sort of provender through the winter but dry straw, were quite feeble and exhausted in the spring. The soil, too, was very stiff, from want of repeated and seasonable tillage. Under such circumstances, it affords no proof of any great heat, that the slothful peasants, oppressed with a load of clothes, usually began their operations in the field before sunrise, while preparing the ground for the reception of the barley-seed.

It is very difficult to ascertain the precise condition of the weather in distant ages. The thermometer was not invented till 1590, by the celebrated Sanctorio; nor was that valuable instrument reduced to a correct standard before the year 1724, by the skill of Fahrenheit. We have hence no observations of temperature which go further back than a century. Prior to this period, we must glean our information from the loose and scanty notices which are scattered through the old chronicles relative to the state of the harvest, the quality of the vintage, or the endurance of frost and snow in the winter. Great allowance, however, should be made for the spirit of exaggeration and the love of the marvellous which infect all those rude historical monuments.

On glancing over the incidental notices of the state of the weather, it is obvious that no material change has taken place for the last thousand years in the climate of Europe; but we may conjecture that it has gradually acquired rather a milder character; at least instances of excessive severity appear on the whole to be of rarer occurrence. The weather seems not to affect any precise course of succession, although two or more years of remarkable heat or cold often follow consecutively; yet there can be no doubt that atmospheric changes, however complicated and perplexing, are as determinate in

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their nature as the revolutions of the celestial bodies. When the science of meteorology is more advanced, we shall, perhaps, by discovering a glimpse of those vast cycles which result from the varied aspects of the sun combined with the feebler influence of the moon, be at length enabled to predict, with some degree of probability, the condition of future seasons. The intermediate period of nine years proposed by Toaldo, or the semi-revolution nearly of the lunar nodes and apogee, seems not to be altogether destitute of foundation. Thus, of the years remarkably cold, 1622 was succeeded, after an interval of four periods or 36 years, by 1658, whose severity lasted through the following season. The same interval brings us to 1695, and five periods more reach to 1740,—a year very famous for cold; three periods now come down to 1767, nine years more to 1776, and eighteen years more to 1794, the cold continuing through 1795. Of the hot years it may be observed, that four periods of nine years extend from 1616 to 1652, and three such again to 1679. From 1701 to 1718 there was an interval of 17 years, or very nearly two periods, while three periods reach to 1745, another period to 1754, and one more falls on 1763; and from 1779 to 1788 there are just nine years. The year 1818 would therefore correspond to 1701, 1719, and 1746, and consequently very nearly to 1718. Again, the years 1784, 1793, 1802, and 1811, at the intervals of successive periods, were all of them remarkably warm. The dry season of 1819, and the hot summer of 1831, follow nearly the same sequence. A cycle of 54 years, therefore, including six of these subordinate periods, has lately been proposed with much confidence, but apparently on very slender grounds.

If the climate had undergone any real change in the more temperate parts of Europe, a corresponding alteration, with very distinct features, must inevitably have taken place in the Arctic regions. But a dispassionate inquiry discovers no circumstances which at all clearly point at such a conclusion. On this head we may

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readily satisfy ourselves by a short retrospect of the principal facts which have been recorded by voyagers.

Greenland, in its position and general outline, appears to resemble the vast promontory of South America. From Cape Farewell, the Staaten Hoek (States' Promontory) of Dutch navigators, situated on a small island in the latitude of 60°, it stretches, in a north-westerly direction, to Cape Desolation, and then nearly northwards to Good Hope in latitude 64° 10′, where it inclines almost a point towards the east, so far as the island of Disco, which occupies a spacious bay in Davis' Strait, between the latitudes of 68° 30′ and 71°. Thence the continent extends about due north, beyond the latitude of 76°, till it is lost in the recesses of Baffin's Bay. On the other side Greenland stretches north-north-east 300 miles, till nearly opposite Iceland, in the latitude of 64°, and then advances almost north-east to the latitude of 75°, when, suddenly bending to the north, it holds this direction beyond Spitzbergen and the latitude of 80°. The coast is every where bold and rocky, like that of Norway; and the interior of the country consists of lofty mountains covered with eternal snows. But the western side, which forms Davis' Strait, is indented with numerous bights, creeks, and *fiords* or firths, which, for the space of two or three months each year, look verdant, and yield tolerable pasturage. The eastern shore, again, which properly bounds the Greenland Seas, can rarely be approached by the whalers, as the accumulated stream of ice, which in summer is constantly drifting from the north-east, creates a formidable barrier. The position of this icy boundary, though nearly parallel to the land, is not absolutely fixed, but varies within certain limits in different years. The late survey by Mr Scoresby was therefore not very satisfactory.

In Davis' Strait the whalers generally resort to Disco Bay, or push farther north; sometimes as far as the latitude of 76°, to the variable margin of the great icy continent. On the other side of Greenland, about the meridian of eight degrees east from Greenwich, the ice,

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in warm seasons, retires to the latitude of 80°, beyond Hakluyt's Headland at the extremity of Spitzbergen; while at other times it advances as far south on the same line as the latitude of 70°, enveloping the whole of that island, but forming below it a wide bay, called the *Whalefisher's Bight*, on the parallel of Bear Island. The former are called *open* and the latter *close* seasons. In open seasons the ships employed in these fisheries find a channel from 20 to 50 leagues wide, through which they shoot forward along the shores of Spitzbergen, till they reach the latitude of 78° or 79°, where the whales are most abundant. The chase of these animals, in the Greenland Seas at least, seldom lasts above two months, commencing generally at the end of April and terminating with June, when they usually disappear, and the prevalence of dense fogs renders the navigation very dangerous. In Davis' Strait the fishery continues often for two or even three months longer. Mr Scoresby thinks it were better if our Greenland ships, like the Dutch and other foreigners, began their voyage somewhat later than has become the practice. In close seasons the hardy navigator is obliged, with imminent peril and hazard, to impel his ship by *boring*, under a press of sail and assisted by ropes and saws, through the drift-ice which borders the great barrier, endeavouring to follow *every vein of water* that runs nearly in the required direction. If he fail in this attempt, he must forego the chance of a profitable voyage, and content himself with the humbler pursuit of catching seals.

The space over which the line of ice may be supposed to oscillate in the Greenland Seas, extends 1400 miles from Cape Farewell to 200 miles beyond Jan Mayen's Island, which it includes, and has a mean breadth of about 80 miles. Such is the extent of the mere surplus ice formed and dissolved from year to year,—exceeding the whole surface of Great Britain. Hence the quantity melted or liberated during the years 1816 and 1817 bore no very considerable proportion to the ordinary fluctu-

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ating mass. It is therefore evident that, whatever may be the casual variations of the frozen expanse, no mighty alteration has yet taken place in the climate and condition of the Arctic Seas.

If we compare the journals of former navigators, we shall be convinced that all the changes of the Polar ice are periodical, and are again repeated at no very distant intervals of time. We may pass over the pretensions of some Dutch captains, who alleged that they had been carried by winds or currents as far north as the latitude of 88°, or even that of 89° 40′, and consequently only twenty miles from the Pole; since their estimate, at all times rude from observations with the fore-staff, was then founded on mere dead reckoning after a continuation of foggy weather. Davis, in 1587, ascended, in the strait which deservedly bears his name, to the latitude of 72° 12′, where he found the variation of the compass to be 32° west, or nearly the same as at present. In 1616, Baffin advanced, in the same quarter as high as the latitude of 78 degrees. Hudson, nine years before, had penetrated in the Greenland Seas to the latitude of 81°, and seen supposed land as high as that of 82° lying to the north-east of Spitzbergen. But it is mortifying to remark how little progress has been made in geographical discovery since those early and intrepid adventurers explored the Arctic regions with their humble barks, which seldom exceeded the size of fifty tons. We must pass over a very long interval to obtain authentic information. In 1751 Captain M'Callam, whom Mr Barrington calls a scientific seaman, sailed without obstruction from Hakluyt's Headland as high as the latitude of 83¼°, where he found an open sea; and the weather being fine, nothing hindered him from proceeding farther but his responsibility to its owners for the safety of the ship. Captain Wilson, about the end of June 1754, having traversed floating ice from the latitude of 74° to 81°, at last found the sea quite clear as far as he could descry; and he advanced to the latitude of 83°, till not meeting with any whales, and

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beginning to apprehend some danger, he shaped back his course. At this very time, Captain Guy, after four days of foggy weather, was likewise carried to the same point. The Polar Seas at that period must indeed have been remarkably open; for one of the most extraordinary and best-authenticated voyages was performed in 1754 by Mr Stephens, a very skilful and accurate observer, whose testimony is put beyond all manner of doubt by the cool judgment of the late astronomer-royal, Dr Maskelyne. This navigator informed him, that about the end of May he was driven off Spitzbergen by a southerly wind, which blew several days, till he had reached the latitude of 84½°, and that in the whole of this run he met with little ice and no drift-wood, and did not find the cold to be anywise excessive. In different years, since that date, the Greenland whalers have advanced to the latitude of 81 or 82 degrees. This was accomplished even in 1766; although, according to Kerguelen, the whole space between Iceland and the opposite coast was then frozen over. The year 1773, or that in which Captain Phipps performed his voyage, was still more favourable for approaching towards the North Pole. In 1806 the elder Mr Scoresby ascended to the latitude of 81° 50′; but in the following year he could not proceed farther than the parallel of 78½°. In 1811 the higher latitudes were again accessible; and, after a short interval, the summers of 1815, 1816, and 1817, are represented as open seasons; though none of the whalers penetrated so far into the north as had been done in many former years, and particularly in 1754.

In this plain statement one can perceive no decided symptoms of any general or progressive tendency towards a dissolution of the Polar ice. The frozen border alters its position from one year to another, and probably returns again to the same limits after certain short periods of time. Such fluctuations are analogous to the incessant changes which affect the state of the weather in the more temperate regions. The complex system of winds

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moulds the climate, and varies the features of the seasons over the globe. It is a common remark of those who frequent the Arctic Seas, that they find the least obstruction from ice when the preceding winter has been very severe in the more southern latitudes. In the year 1766, though the frost had proved most intense through the rest of Europe, the whalers reached a high latitude; and, not to multiply instances, the three seasons preceding 1818, reckoned very open, succeeded to winters notoriously cold and protracted. Nor is it difficult to discern the reason of this seeming paradox; for our severe winters are occasioned by the prevalence of northerly winds, which must arrive at the Polar Seas from the South, and consequently transport so much warmth to them as may check the usual rigour of the frost.

The main argument, however, brought to prove the deterioration of the Arctic climate, is drawn from the supposed existence of a colony which had once flourished on the eastern coast of Greenland, but has for several centuries been extinct; all access to its remains being at length completely barred by the accumulation of ice. This tale, which seems to have owed its birth to Torfæus, the historian of Norway, has obtained very general credence. Yet a sober examination of the early *Sagas*, or northern chronicles, so full of wonder and fable, will show that there is no solid reason for entertaining such a notion, or believing that the first settlement of Greenland was made on the east side of the continent. The whole contexture of the original narrative indicates the very opposite conclusion.

After the North had ceased to send forth her numerous swarms upon the fertile provinces of the Roman empire, the Scandinavian nations, prompted by their peculiar situation, betook themselves to a life of maritime adventure. Those bold and hardy pirates visited every sea, and pillaged, during a course of nearly three hundred years, all the coasts of Europe, from the extremity of Scotland to the shores of Sicily. During

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the first half of the ninth century, they conquered the Orkneys, the Shetland and Western Isles—obtained possession of Ireland—plundered England and France —and extended their ravages to Italy. In 876 the Northmen, or Normans, extorted from the weakness of the French king the cession of the fine province of Neustria, where they quietly settled; while another party of these fierce invaders had occupied the fertile coast of Esthonia, on the south side of the Baltic.

But the visits of those intrepid navigators were not confined to the richer countries of the South. They carried ravens with them, for the purpose of discovering distant land by the direction in which these powerful and sagacious birds took their flight. In 861 Nadodd, a roving pirate, in one of his voyages in the northern seas, happened to be cast away on an island which he called *Snowland*. Three years afterwards, Garder and Flocke, two Swedes, visited it; and having found a great quantity of drift-ice collected on the north side of it, they gave it the name of *Iceland*, which it still bears. But in 874 Ingolf and Leif, two famous Norwegian adventurers, carried a colony to this inhospitable region, —the latter having enriched it with the booty which he had ravaged from England. Other emigrants, whom the disorders of the times drove successively from home, resorted in crowds to the new settlement, which became very considerable in the space of a few years.

Iceland itself was able, after the progress of about a century, to send out likewise her colonies. Thorwald, a proud and opulent Norwegian chief, who had been lately banished thither from the court for some murder committed by him, soon died in exile, leaving his wealth and his restless spirit to his son Eric *Raude*, or the *Red*. This youth, actuated by the same vengeful passions, killed one of his neighbours in a fight, and was obliged to withdraw himself from Iceland for the space of three years. In 982 Eric sailed in quest of adventure and discovery. Instructed by the reports of former navigators, he directed his course towards the south-west.

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After a quick run, he descried two lofty mountains, the one covered with snow and the other cased with ice, which he called *Huitserken* and *Blaaserken*, or *the White Shirt* and *the Blue Shirt*, and soon reached a headland which he doubled; and having entered a spacious creek, he spent the winter on a pleasant adjacent island. In the following season, pursuing his discoveries, he explored the continent, and was delighted with the freshness and verdure of its coast. Contrasting this new country with the dark rocks of Iceland, he bestowed on it the flattering appellation of *Greenland;* and on his return invited settlers to join him, by circulating the most glowing and exaggerated descriptions. With twenty-five vessels he sailed back again; but of these only fourteen reached their destination. This colony was soon augmented by the arrival of numerous adventurers, not only from Iceland, but from the Orkneys and other islands planted by the Norwegians. In the year 999, Leif, a son of Eric Raude, having visited the court of Norway, was induced, by the zealous and earnest solicitation of King Olaf Tryggeson, to embrace the Christian faith; and, carrying with him some monks, he found, through their ministry, no great difficulty in persuading his father and the rest of the settlers to forsake the rites of paganism.

The first colony having extended itself along the coast to a wide firth, another settlement beyond that boundary was established farther towards the west. The former called *Oestre Bygd*, or the *Eastern Settlement*, is said to have included, in its most flourishing state, twelve parishes and two convents; and the latter, termed *Vestre Bygd*, or the *Western Settlement*, contained four parishes. The colonists of Greenland were compelled to lead a life of hardship and severe privation. They dwelt in hovels surrounded by mountains of perpetual ice; they never tasted bread, but subsisted on the fish which they caught, joined to a little milk obtained from their starving cows; and with seal-skins and the tusks of the walrus they purchased from the

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traders who occasionally visited them the wood required for fuel and the construction of their huts.

Combining the several circumstances together, it seems clear that the original colony of Greenland began about the southern promontory, near Cape Farewell, and stretched along the coast in a north-westerly direction. Farther north, and probably as high as the latitude of 60°, the second settlement was formed.* For some centuries both of them maintained a sort of commercial intercourse with Norway; but this trade became afterwards very much reduced, in consequence of its being seized as an exclusive privilege of the Danish court. About the year 1376, the natives of the country, or Esquimaux invaders, whom the Norwegian settlers had in contempt called *Skrællings* or *Dwarfs*, attacked the western colony, which now claimed the assistance of its elder brother. The scanty population, however, was enfeebled by such repeated alarms; and that dreadful pestilence, termed the *Black Death*, which raged throughout Europe from the year 1402 to 1404, at last extended its ravages to Greenland, and nearly completed the devastation. In fertile regions the waste of the human species is always quickly repaired; but poor and barren countries can seldom recover from the depression caused by such severe calamities. The colonies which occupied Greenland appear to have languished near one hundred years afterwards, till they became finally extinct about the commencement of the sixteenth century.

But a notion has very generally prevailed, that only the western settlement of Greenland had perished, while the eastern was merely secluded from communication

* A curious monument has been lately discovered, that attests the zeal with which the early Scandinavian adventurers pushed their settlements to the most northern parts of Greenland. It is a stone carved with Runic characters, found in 1824, planted erect in the ground on the island of Kingiktorsoak, under the parallel of 73°. The inscription has been translated by Dr Rafn, Secretary of the Royal Antiquarian Society of Copenhagen, as follows:—

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with the rest of the world by a vast barrier of ice, which had at length accumulated on its shores. The only

"Erling Sigvatson, and Bjarne Thordarson, and Endride Oddson, erected these memorial-stones and cleared the place, on Saturday before Gagndag (*the 25th of April*), in the year 1135."

Those enterprising settlers must therefore have, as early as the twelfth century, come into communication with the Esquimaux of North America. Allowing for the difference of style at that epoch (being three days for every four centuries), the stone was erected on the 1st of May, at which time the ground seems to have been covered with snow.

*For this curious notice the author is indebted to his very ingenious, learned, and amiable friend, Dr T. Stewart Traill of Liverpool.**

* Dr Traill has, since the date of this acknowledgment by Sir John Leslie, been appointed Professor of Medical Jurisprudence in the University of Edinburgh.

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question lately entertained was, whether these ill-fated colonists survived the catastrophe, or were suddenly entombed in ice and snow, as the unhappy citizens of Herculaneum were anciently involved in a dense shower of volcanic ashes. Tremendous stories are told of the east side of Greenland being now tenanted by giants and stalking ghosts. For more than a century past the court of Denmark has, at different times, despatched ships to search after its lost colony, the crews of which, evidently under the impression of superstitious awe, found it impossible to penetrate on that enchanted coast farther than Cape Discord, in the latitude of 61°. But in favourable seasons small boats can, without much difficulty, creep along the shore to a much higher parallel. If any settlers had ever occupied the narrow bays, they might surely have escaped either in their canoes or in sledges.

The supposed existence of a colony on the east side of Greenland is clearly a fable, originating in a misapprehension of the import of the designations applied severally to the two settlements. The one first made lay no doubt to the east, as well as to the south of the other; but the ships which resorted from Norway held a westerly course for them both. Between them a

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But such was the scrupulous anxiety of the publishers to procure the most accurate information, that they stopped the press to consult a gentleman in this country, deeply skilled in the Runic,—Mr Repp of the Advocates' Library,—who has obligingly furnished the following reading of the inscription, with a translation somewhat different:—

"Oelligr Siguathssonr ok Baaos Tortarson ok Oenrithi Osson: Laugardagin fyrir gagndag hlóthu Varda dis ok rytu." (*The five last figures of the inscription are utterly unknown.*)

That is, "Oelligr Sighwathson, and Baaos Tortarson, and Oenrithi Osson, on the Saturday before *Gagndag** erected *Thorvard's* monument, and wrote this." (*And then the compound characters.*)

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* Gagndagr, in nominative, of which we have here the accusative case Gagndag, were two holidays of the Catholic Church in Iceland. There was a *greater* and a *lesser*.—(Gagndagrin Meiri ok Minni). As to the exact time when they occurred, see "Finni Johannæi Historia Ecclesiastica Islandiæ," under the word Gagndag in the Index, vol. iv.

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mutual intercourse appears likewise to have been maintained, which surely could not have taken place had they been divided by a chain of lofty and impassable mountains covered with eternal snow. Besides, traces of those ancient settlements are observed, even at present, scattered along the western shores of Greenland, as low down as the latitude of 61°, though not corresponding altogether with the poetical descriptions of the Icelandic Sagas. Except the very scanty ruins of a church, the only vestiges now remaining consist of low naked walls, which must have served as pens for sheltering the cattle.

It may be safely affirmed that the settlements which, during the last hundred years, the Danes have been forming at various points on the western side of Greenland are more numerous and thriving than those which existed at any former period. They consist of twenty-one colonies, stretching over an extent of 800 miles. The first establishment is only a single family, occupying Bear Island, a little to the east of Cape Farewell. Ten other hamlets, composed chiefly of Moravians, are planted at different points, from the latitude of 60° to that of 68°. Three settlements are distributed round Disco Bay, about the latitude of 69°; and seven more have been extended thence as high as the latitude of 73°. So far, therefore, from the population having been extirpated by the increased severity of the climate, the truth appears to be, that the present establishments on the coast of Greenland extend ten degrees farther north than the ancient settlements at their most flourishing period. This advance of the colonies has been owing, no doubt, to the increased activity of the whale-fisheries, and to the circumstance of these pursuits having been lately carried with success into Davis' Strait. But there is nothing certainly in their history which betrays any radical or permanent change in the climate of the Arctic regions. The same continent of ice still remains during the far greater part of the year, to bar the access of the navigator to the Pole.

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CHAPTER II.

Animal and Vegetable Life in the Polar Regions.

Remarkable Profusion of Animal Life—Means by which it is supported—The Cetacea: Whale, Narwal, Walrus, Seal—The Herring.——Land Animals—The Polar Bear; Its Ferocity; Anecdotes—The Rein-deer—Wolf, Fox, Dog—Birds—Vegetable Life—Peculiar Plants—Red Snow.

When we contemplate the aspect of the northern world,—bleak, naked, dreary, beaten by the raging tempest, and subject to an extremity of cold which with us is fatal to life and to all by which life is supported,—we naturally imagine that animal nature must exist there on a small scale, and under puny forms. It might be expected that only a few dwarf and stunted species would be scattered along its melancholy shores, and that the animating principle, as it attempted to penetrate those realms of desolation, would grow faint and expire. But, on the contrary, Nature, whose ways and power far surpass human comprehension, makes a full display of her inexhaustible resources. She has filled the naked rocks and wintry seas with a profusion of organized beings, such as are scarcely brought forth under the most genial glow of tropical suns; storing them with the mightiest of living things, compared to which the elephant and hippopotamus, which rear their immense shapes amid the marshy plains of the tropics, seem almost diminutive. Even the smaller species, of which the herring may be taken for an example, are found amid the depths of the Arctic zone, in shoals which astonish by their immensity. The air, too, is darkened by in-

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numerable flocks of sea-fowl, while, even upon the frozen surface of the land, animals of peculiar form find food suited to their various wants.

By what means, or by what resources, does she support, in such circumstances, this immensity of life? Wonderful as are her operations, they are always conducted agreeably to the general laws imposed upon the universe; and we shall find, in the structure and condition of the animal world, the powers by which its various members are enabled to defy this frightful rigour of the elements. Some of the provisions whereby their frames are adapted to the extremes of climate, have, at first sight, the appearance of direct interposition; yet a more profound investigation always discovers the causes of them to be deeply lodged in their physical organization.

It is on the seas and shores of the Arctic zone that we chiefly observe this boundless profusion of creative energy; and in conformity with that arrangement by which Nature supports the inhabitants of the waters, by making them the food of each other, so here also we observe a continued gradation of animals, rising one above another, the higher preying upon the lower, till at last an aliment is provided for those of largest bulk and most devouring appetite.

The basis of subsistence for the numerous tribes of the Arctic world is found in the genus *Medusa* of Linnæus, which the sailors graphically describe as sea-blubber. This is a soft, elastic, gelatinous substance, specimens of which may often be seen lying on our own shores, exhibiting no signs of life except that of shrinking when touched. Beyond the Arctic circle this production increases in an extraordinary degree, and is eagerly devoured by all the finny tribes. By far the most numerous, however, of the medusan races are of dimensions too small to be discerned without the aid of the microscope,—the application of which instrument shows them to be the cause of a peculiar tinge observed over a great extent of the Greenland Sea. This colour is olive-green, and the water is dark and opaque compared to that which bears the common

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cerulean hue. The portion of the ocean so distinguished amounts to not less than 20,000 square miles; and hence the number of animalcules which that space contains is far beyond calculation. Mr Scoresby estimates that two square miles comprehend 23,888,000,000,000,000; and as such an amount is above the range of human words and conceptions, he illustrates it by observing that 80,000 persons would have been employed since the creation in counting it. This green sea may be considered as the Polar pasture-ground, where whales are always seen in the greatest numbers. These prodigious creatures, it is true, cannot derive any direct subsistence from particles so very small; but these last form the food of other minute fishes, which in their turn support a third series, till at length, as has been already remarked, animals are produced of such size as to afford a morsel for the mighty devourers. The genus *Cancer*, of the same writer, or members of the class *Crustacea*, appear to rank second in number and importance. They present themselves under the various species of the crab, and, above all, of the shrimp, whose multitudes rival those of the medusa, and which in all quarters are seen either pursuing their prey, or becoming the food of a higher class of marine animals. So carnivorous, indeed, are the northern shrimps, that joints of meat hung out by Captain Parry's crew from the sides of the ship were in a few nights picked to the very bone. Many of the zoophytical and molluscous orders, too, particularly *Actinia*, *Sepia*, and several species of marine worms, are employed by Nature as the means of supplying food to various inhabitants of the deep possessing a more perfect organization.

Among the numberless tribes of living things which people the northern seas, one order stands highly conspicuous. These are the *Cetacea*, comprehending the largest of existing animals, and having a structure wholly distinct from every other species. Although their home be entirely in the depth of the waters, they have several features in common with quadrupeds, and, in fact, belong

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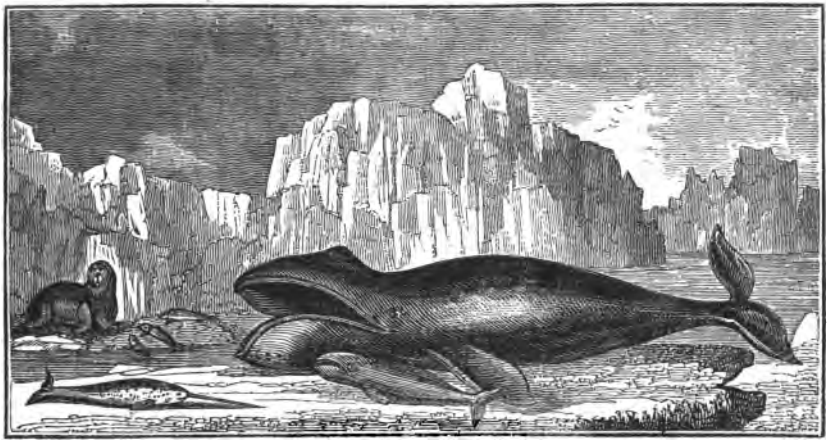

Whale with its Cub, Narwal, &c.

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to the Linnæan class of *Mammalia*, or suck-giving creatures. They produce their young alive; their skin is smooth and without scales; their blood is warm; and the flesh tastes somewhat like coarse beef. They have a heart with two ventricles, and lungs through which they respire; and being unable to separate the air from the water, as fishes do by means of their gills, they must come to the surface in order to breathe. It is thus by no means strictly scientific to call the whale a fish; yet he is entirely an inhabitant of the sea, having a tail, though placed in a different position from that of ordinary fishes, while his front limbs much more resemble fins than legs, and are solely used for pawing the deep. Hence the vulgar, following a natural and descriptive classification, obstinately continue to give the name of fish to these watery monsters. But the most characteristic and important feature of the *Cetacea*, consists in a thick layer of fatty substance, called blubber, lodged beneath the skin and surrounding the body, which yields, on expression, nearly its own bulk of thick, coarse, viscid oil. It is by this covering that Providence enables them to defy the utmost extremity of cold, and to preserve a strong animal heat even under the eternal ice of the Pole. Yet this substance, being subservient to the uses of man, has roused a dreadful and deadly enemy, who employs against them the resources of *art*,—a power which mere brutal force seeks in vain to oppose. He pursues them through ice and tempest, and dyes the seas with their blood. They themselves are meek, peaceful, sluggish; and man, in the contest which he wages with them, is almost always the aggressor; though the resistance which he then encounters is sometimes terrible, and his life is occasionally the forfeit.

Among the cetaceous tribes the chief place is due to the *whale*, of all animals "mightiest that swim the ocean stream." Enormous as his bulk is, rumour and the love of the marvellous have represented it as being at one time much greater, and the existing race as only

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the degenerate remnant of mightier ancestors. Mr Scoresby, however, by collecting various good authorities, has proved that sixty feet was always nearly the utmost length of the *mysticetus*, or great Greenland whale. Of 322 individuals in the capture of which that gentleman was concerned, none occurred of a length exceeding 58 feet; and he therefore places no reliance on the report of any specimen exceeding 70 feet. Even 60 feet implies a weight of 70 tons, being nearly that of 300 fat oxen. Of this vast mass, the oil in a rich whale composes about thirty tuns, and when, as was the case some years ago, that article brought £55 or £60 per tun, we may form some idea of the great value of the prize. The bones of the head, fins, and tail, which are also valuable, weigh eight or ten tons. The oleaginous substance, or blubber, forms a complete wrapper round the whole body, from eight to twenty inches in thickness. The head is disproportionally large, being about a third of the entire bulk; and the lips, nearly twenty feet long, display, when open, a cavity capable of receiving a ship's jolly-boat with her crew. The whale has no external ear; but, when the skin is removed, a small aperture is discerned for the admission of sound. This sense accordingly is very imperfect; yet the animal, by a quick perception of all movements made on the water, discovers danger at a great distance. The eyes are likewise on a small scale, though the sense of seeing is acute; more so, however, through clear water than in the open air. But the most unique feature in the structure of this animal consists in the *spiracles* or blow-holes, placed nearly on the crown of the head. These have been compared to natural *jets d'eau* throwing up water to the height of 40 or 50 feet; though the more careful scrutiny of Mr Scoresby ascertained that they emit only a moist vapour, and are neither more nor less than huge nostrils. When, however, this vehement breathing or blowing is performed under the surface, a considerable quantity of water is thrown up into the air. The sound thus occasioned is the only

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thing like a voice emitted by the animal, and, in the case of a violent respiration, it resembles the discharge of a cannon.

The tail is the most active limb of this monarch of the deep, and the chief instrument of his motion. It does not rise vertically like that of most fishes, being flat and horizontal, only four or five feet long, but more than twenty feet broad. It consists of two beds of muscles, connected with an extensive layer surrounding the body, and enclosed by a thin covering of blubber. Its power is tremendous. A single stroke throws a large boat with all its crew into the air. Sometimes he places himself in a perpendicular position with the head downwards, and, rearing his tail on high, beats the water with awful violence. On these occasions the sea foams, and vapours darken the air; the lashing is heard several miles off, like the roar of a distant tempest. At other times he makes an immense spring, and lifts his whole body above the waves, to the admiration of the experienced whaler, but to the terror of those who see for the first time this astonishing spectacle. Other motions, equally indicative of his boundless strength, attract the attention of the navigator at a great distance.

The fins, called by the French *nageoires*, and by Dr Fleming "swimming-paws," are placed immediately behind the eyes. They are nine feet long, enclosed by very elastic membranes, and provided with bones similar in form and number to those of the human hand. Such is the spring and vitality of the parts, that, if we may believe De Reste, they continue to move for some time after being separated from the body. According to Mr Scoresby, however, while the whale swims these organs lie flat on the surface of the water, and are not at all instrumental in producing his motion, which arises entirely from the tail. The fins merely direct and steady the movement, and serve rather as a helm than as oars.

The period of gestation in the whale is nine or ten months, and the female brings forth in February or March. She is viviparous; that is, the young come forth

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alive, not enclosed in an egg; and usually, there is not more than one at a time. These nurslings, about fourteen feet long and weighing somewhat more than a ton, are watched over by the female parent with the most tender care. The whalers strike the *suckers*, as they are called, not for their own value, but knowing that the mothers will start forth in their defence. Then ensues a contest hard and perilous, but commonly attended with a prosperous issue, for she never seeks safety in flight. She rushes upon the boat, drags the line with extraordinary force, tosses to and fro in extreme agony, and suffers herself to be struck by repeated harpoons without attempting to escape; while the humane captain has his triumphant feelings damped by the consideration, that his prize has fallen the victim of maternal tenderness. According to indications afforded by notches in the bone, which seem not, however, very distinctly ascertained, the whale does not attain his full growth under twenty-five years, and is said to reach a very great age.

There is a considerable variety of these animals. The *Balæna physalis* (*Balænoptera gibbar* of La Cépède), called by the sailors *razorback*, is considerably longer than the mysticetus; and, though his circumference be smaller, he is on the whole larger and much more powerful. He is also swifter, swimming at the rate of twelve miles an hour; and Mr Scoresby has seen one, when struck with a harpoon, run off 480 fathoms of line in a minute. An individual of this species, found dead in Davis' Strait, measured 105 feet in length. It is, as might be apprehended, extremely dangerous to attack him; for, by the extreme rapidity of his motion, he often breaks the line, or obliges the sailors to cut it in order to escape destruction. Martens mentions an instance of one which dragged a boat with its crew among loose ice where they all perished. Besides, as this fish contains only ten or twelve tuns of oil, of an inferior quality, the whalers generally shun the encounter, unless when they are disposed for a daring adven-

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ture, or mistake him, as they frequently do, for a mysticetus. Besides the two pectoral fins, he has a horny protuberance or fin at the extremity of the back, which part of the body, instead of being round as in the other variety, rises into a narrow ridge. The *Balæna musculus* or broad-nosed whale, the *Balæna rostrata* or beaked whale, and the *Balæna boops* or finner, may be considered as razorbacks on a smaller scale, with certain specific distinctions. It is usually individuals of the kinds now described that frequent the coasts of Norway and Shetland, and sometimes make their appearance in the British firths; but neither they nor the physalis ever attract the attention of an experienced fisher.

The only species, besides the mysticetus, regularly sought after, is the *cachalot* (*Physeter macrops*) or spermaceti whale. This variety occurs occasionally in the northern seas, especially on the American coast, but abounds chiefly in the waters bordering on the Antarctic zone, and is the main object of pursuit in the southern fishery. The cachalot does not seem to have met Mr Scoresby's observation, although a male was thrown ashore at Limekilns on the Forth, as described by Sir Robert Sibbald; but, according to the description of De Reste and others, this species is distinguished by a long row of teeth on the lower and none on the upper jaw; the back has a peculiar form, with a small bunch behind; and the tail is of extraordinary breadth. They appear in large herds; while the mysticetus, called by our fishers the *right* whale, is generally found single. These bands very often amount to two hundred, which are said to be for the most part female, and usually under the guidance of a male of very large dimensions. To attack them is a formidable undertaking; but success is very advantageous, since ten or twelve sometimes fall in one encounter. The perils of this fishery are described as almost exceeding belief; for which reason, it is to be regretted that Captain Day's modesty makes him decline recounting any of those which he witnessed. The quantity of oil is much smaller than in the mys-

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ticetus, usually not exceeding three tuns; but, from its being mixed with the substance called spermaceti, is far superior in value. When warm it is fluid; but on being poured into water it congeals into large flakes. This whale yields also the peculiar aromatic substance called ambergris, formed under certain circumstances in the rectum, and voided as fæces.

Another species, called the *narwal*, about sixteen feet long and eight in circumference, appears to differ little from a small whale, except in a tusk projecting from his upper jaw three to ten feet in length, which, suggesting to the sailors the idea of a horn, has procured for him the appellation of the sea-unicorn. He is swift, yet is taken without much difficulty, and yields two or three tuns of very fine oil. The dolphin, another cetaceous animal of poetic fame, occasionally occurs; and the grampus often appears in numerous herds, guided by some of larger size. The *beluga*, or white whale, is also a separate species, distinguished chiefly by its peculiar colour.

All the shores and borders of the Arctic zone are crowded with amphibious species, which appear to form an intermediate link between whales and quadrupeds,—the *Mammalia* of the sea and those of the land. Among these is to be distinguished the morse or walrus (*Trichecus rosmarus*), which bears such a resemblance to our domestic quadrupeds that sailors, according to their various impressions, have given it the title of sea-horse or sea-cow. It is a large, shapeless, unwieldy creature, 12 to 15 feet in length and from 8 to 10 in circumference; the head small, the limbs short, of an intermediate character between fins and legs. As a defence against the extreme cold, these animals not only have skins an inch thick, covered with close hair, but enjoy, like the other *Cetacea*, a coating of oily fat, with which their bodies are completely enveloped. Thus cased, they lie stretched on the ice in the depth of winter, without suffering any inconvenience. The most remarkable feature of the walrus, however, consists in

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two teeth or tusks, which project in a curved line from the upper jaw, and are nearly two feet in length. They are of beautiful white bone, almost equal to ivory, and much used in the fabrication of artificial teeth. The front face, when seen at a little distance, bears a striking resemblance to the human; and its appearance is suspected to have sometimes given rise to the fanciful reports of mermaids in the northern seas. Like all the cetaceous tribes, to which the walrus is allied, he is disposed to be peaceful and harmless. Captain Parry describes the supine security with which a number of them lay on the ice, piled over each other, without discomposing themselves at the approach of a party armed for their destruction. In Spitzbergen, however, where they have been long the object of chase to the Russian hunters, they are reported to keep very strict watch; it being said that one stands guard while the others sleep. Even when sensible of danger, they are not forward to face it, but rather shun the attack by rushing beneath the ice, while those behind, with their tusks, urge forward their companions. Yet, when they are compelled to combat, they give battle with the utmost coolness and courage; they then stand firm by each other, rush in one united body against the boats, and, striking with their tusks, endeavour to overset them. When repulsed, too, they repeatedly rally, and in the end yield only to the fire-arms of Europeans, or to the stratagems of the Esquimaux. Maternal tenderness, and the determination with which the female defends her young, are equally conspicuous in them as in the whale species.

The seal, an animal well known on all the shores of Europe, requires not to be particularly described. The Arctic species are very numerous, and are applied by the Esquimaux for a great variety of purposes. They furnish food for his table, oil for his lamp, clothing for his person; even their bones and skins supply materials for his light portable boats and his summer tents.

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Before quitting the Polar Ocean we must notice another fish, whose periodical appearance renders it familiar to all the European coasts. Those waters, as already observed, apparently so chill and ungenial, contain not only an ample store of animal life, but a vast superabundance, with which they have been supposed to supply the seas of the more temperate climates. From them, in particular, if we may believe some naturalists, are derived the valuable tribes of the herring; the immense shoals of which, according to Bloch, Pennant, and others, issue from the frozen depths about January, and in March appear on the coasts of Iceland. Their column at this time, confined between Greenland and the North Cape, is of comparatively small breadth, but so dense that the water is darkened by them; any wooden vessel let down brings up several: they may even be taken by the stroke of a lance. They follow certain of their number larger than the rest, called kings. These leaders are held in much respect by the Dutch, who studiously spare their majesties, and even liberate them when found in the net, lest, deprived of this royal guidance, the nation should not find the way to their accustomed haunts. After emerging from the Greenland Sea, this great army divides into two wings,—the right and largest bearing down directly upon Scotland; at the north-eastern extremity of which it forms that immense field wherein the Dutch for many years carried on their great national fishery. A detachment smaller in number, but some of which attain to superior excellence, fills the western bays of Scotland, and, passing along Ireland, reaches the neighbouring coast of France. Meantime the left, or smaller wing, after ranging the Norwegian shore, enters the Baltic. In July all these divisions halt, and by an unknown impulse begin to retrace their course towards their northern home. De Reste considers it certain that the herrings, in returning, have a general point of rendezvous which still remains unknown; but it should seem that nothing less than the

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Arctic Animals—Polar Bear, Rein-deer, Wolf, Fox, Dog, &c.

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actual discovery of this place of meeting can ascertain its existence. However, about the end of September they reach their destination beneath the ice of the Polar regions, where they remain three months,—all the rest of the year being spent in wandering over the face of the ocean.

Such is the theory of the annual appearance of the herring, which has been adopted without sufficient investigation by many popular writers. Later observation, accordingly, has thrown doubts upon the principle of Arctic migration, and referred this periodical appearance upon the coasts of Europe to that instinctive impulse which guides the finny tribes, at the season of reproduction, to places where the spawn may be deposited and the young find food. When this is accomplished, they retire from the shores to their habitation in deeper waters. The female, when taken in our seas, is commonly found to contain a roe; and as this comprises the embryo of ten thousand future herrings, such a prodigious fecundity easily repairs all the havock committed upon the species, not only by their brethren of the deep, but also by the ingenuity of man, constantly exerted for their capture and destruction.

The other animals which frequent the Polar regions belong chiefly or wholly to the land.

In caves, or in the hollows of the ice, dwells the most formidable of Arctic quadrupeds, the Greenland bear. This tyrant of the cliffs and snows unites the strength of the lion with the untameable fierceness of the hyena. A long shaggy covering of white soft hair and a copious supply of fat enable him to defy the winter of this rigorous climate. Hence, when exposed even to the moderate heat of Britain, he appears to labour under great uneasiness. Pennant saw one, over whom it was necessary from time to time to pour large pailfuls of water. Another, kept for some years by Professor Jameson, evidently suffered severely from the comparative warmth of an Edinburgh summer. The haunt of this voracious inhabitant of the Polar regions

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is on the frozen shore, or on mountains of ice, sometimes two hundred miles from land; yet he is not, strictly speaking, amphibious. He cannot remain under water above a few moments, and he makes his way to sea only by swimming from one icy fragment to another. Mr Scoresby limits his powers in this respect to three or four miles; yet Parry found one in the centre of Barrow's Strait, where it was forty miles across. His prey consists chiefly of the smaller cetacea and of seals, which, unable to contend with him, shun their fate by keeping strict watch, and plunging into the deep waters. With the walrus he wages a fierce and doubtful war; and that powerful animal, with his enormous tusks, frequently beats him off with great damage. The whale he dares not attack, but watches anxiously for the huge carcass in a dead state, which affords him a prolonged and delicious feast: he scents it at the distance of miles. All these sources of supply being precarious, he is sometimes left for weeks without food, and the fury of his hunger then becomes tremendous. At such periods man, viewed by him always as his prey, is attacked with peculiar fierceness.

The annals of northern navigation are filled with accounts of the most perilous and fatal conflicts with the Polar bear. The first, and one of the most tragical, was sustained by Barentz and Heemskerke, in 1596, during their voyage for the discovery of the north-east passage. Having anchored at an island near the Strait of Waygatz, two of the men landed, and were walking on shore, when one of them felt himself closely hugged from behind. Thinking this a frolic of one of his companions, he called out, in a jocular tone, "Who's there? pray stand off." His comrade looked and screamed out, "A bear! a bear!" then running to the ship alarmed the crew with loud cries. The sailors ran to the spot, armed with pikes and muskets. On their approach the animal very coolly quitted the mangled corpse, sprang upon one of the assailants, carried him off, and plunging his teeth into his body, began drinking his

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blood at long draughts. Hereupon the whole party, struck with terror, turned their backs, and fled precipitately to their vessel. On arriving there they began to look at each other, ashamed in some measure of their pusillanimous conduct. Three of them immediately resolved to avenge the fate of their countrymen, and to secure for their remains the rites of burial. They advanced, but fired at first from so great a distance that all of them missed. The purser then courageously proceeded in front of his companions, and, taking a close aim, pierced the monster's skull, immediately below the eye. The bear, however, merely lifted his head, and ran towards them, holding still in his mouth the victim whom he was devouring; but seeing him stagger, the three rushed on with sabre and bayonet, and soon despatched him. They collected and bestowed decent sepulture on the mangled limbs of their comrades; while the skin of the animal, thirteen feet long, became the prize of him who fired the successful shot.

The history of whale-fishing records a number of remarkable escapes from the Polar bear. In 1668, Jonge Kees, the master of a Dutch ship, undertook with two canoes to attack one, and with a lance gave him so dreadful a wound in the belly that his immediate death seemed inevitable. Anxious, therefore, not to injure the skin, Kees merely followed the animal till he should drop down dead. The quadruped, however, having climbed a little rock, made a spring from the distance of twenty-four feet upon the skipper, who, taken completely by surprise, lost hold of the lance, and fell beneath his assailant, which, placing both paws on his breast, opened two rows of tremendous teeth, and paused for a moment, as if to show him all the horrors of his situation. At this critical instant a sailor, rushing forward with only a scoop, succeeded in alarming the monster, which made off, leaving the captain without the slightest injury.

In 1788, Captain Cook of the Archangel, when near the coast of Spitzbergen, found himself suddenly at-

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tacked by a bear. He instantly called on the surgeon who accompanied him to fire; which the latter did with such admirable promptitude and precision, that he shot the beast through the head, and delivered his commander. Mr Hawkins of the Everthorpe, in July 1818, having pursued and twice struck a large one, had raised his lance for a third blow, when it sprang forward, seized him by the thigh, and threw him over its head into the water. Fortunately it used this advantage only to effect its own escape. Captain Scoresby mentions a boat's crew which attacked a bear in the Greenland Sea; but the animal having succeeded in climbing the sides of the boat, all the men dropped themselves for safety into the waves, where they hung by the gunwale. The victor entered triumphantly, and took possession of the barge, where it sat quietly till it was shot by another party. The same writer mentions the ingenious contrivance of a sailor, who, being chased by one of these creatures, threw down successively his hat, jacket, handkerchief, and every other article in his possession, when the pursuer pausing at each, gave the seaman always a certain advantage, and enabled him finally to regain the vessel.

Though the voracity of this savage creature is such that he has been known to feed on his own species, yet maternal tenderness is as conspicuous in the female as in other inhabitants of the frozen regions. There is no exertion which she will not make for the supply of her progeny. A she-bear, with her two cubs, being hunted by some sailors across a field of ice, and finding that, neither by example nor by a peculiar voice and action, she could urge them to the requisite speed, applied her paws and pitched them alternately forward. The little creatures, as she came up, threw themselves before her to receive the impulse, and thus both she and they escaped from danger.

None of the varieties, indeed, are devoid of intelligence; while their schemes for entrapping seals and

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other animals on which they feed often display considerable ingenuity. The manner in which the Polar bear surprises his victim is thus described by Captain Lyon:—On seeing his intended prey he gets quietly into the water, and swims to a leeward position, from whence, by frequent short dives, he silently makes his approaches, and so arranges his distance, that at the last dive he comes to the spot where the seal is lying. If the poor animal attempts to escape by rolling into the water, he falls into the paws of his enemy; if, on the contrary, he lies still, his destroyer makes a powerful spring, kills him on the ice, and devours him at leisure. Some sailors, endeavouring to catch a bear, placed the noose of a rope under the snow, baited with a piece of whale's flesh. He, however, contrived, three successive times, to push the noose aside, and unhurt to carry off the bait. Captain Scoresby had half-tamed two cubs, which used even to walk the deck; but they showed themselves always restless under this confinement, and finally sought relief in their native element.

According to Pennant and other writers, the bear forms chambers in the great ice-mountains, where he sleeps during the long Arctic night, undisturbed by the roar of the tempest; but this regular hibernation is doubted by many recent observers. The fact seems to be, that the males roam about all winter in search of prey, not being under the same necessity of submitting to the torpid state as the black bear of America, which feeds chiefly on vegetables; but the females, who are usually pregnant in the more rigorous season, seclude themselves nearly the whole time in their dens.

The animals which belong entirely to the land, and feed on herbage, are, in a climate covered with snow nine months in the year, necessarily few both in number and species. The rein-deer, a most patient and useful creature, an inhabitant of the Polar regions, may be said to subsist as far north as animal life can

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be maintained. To the Laplander he is all in all; and in that dreary portion of the globe he can always dig from under the snow the moss or lichen, his favourite food. Even in the severer climates he carries his summer-excursions as far as men have yet penetrated; but at the end of October the intense frost no longer allows him to reach even the simple pasture in which he delights. It is then that large herds are observed to assemble and migrate to the southward. From Melville Island they were seen crossing the frozen surface of the sea, to gain a milder climate on the American shore. The people within the Arctic zone do not tame the rein-deer, nor yoke it in the sledge; it is not even for them the staff of life; but it affords a favourite object of summer-hunting, gives an agreeable variety to their meals, and yields their warmest and most valuable winter-robes. The fur-skin becomes always richer and more copious in proportion to the intensity of the cold, against which it forms the only defence. In the chase the deer fall easy victims, even to the rude archery of the Esquimaux, being so simple and curious, that if a man merely walks away from them, they follow. Some of these animals, which joined Captain Parry's crews on Melville Island, played round them like lapdogs, and at setting out in the morning used to gambol by rearing on their hind-legs. The musk-ox, the only member of the bovine species which penetrates the Arctic zone, though in smaller numbers, constitutes also a wholesome food. Its unwieldly form is protected from the cold by an immense profusion of hair, which envelops its whole limbs and figure, and also by an interior layer of wool, that appeared to Pennant the finest he had ever seen, and made, he was told, stockings superior to the richest silk. This last, we suspect, is a temporary clothing.

The canine race presents several species which brave the most extreme severity of cold, and remain after every other land-quadruped, except the bear, has taken its flight to the southward. Wolves, in considerable

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numbers, continue to seek their prey in the utmost depths of the Polar winter. It seems difficult to discover what food they find at that season; but a regular pack attended the English discovery-ships, watching for whatever offal might be found exposed, and serenading them with nightly howlings. As if by a sort of tacit convention, they did not presume to attack the sailors; but they advanced in the most daring manner to the sides of the vessels, and sometimes even entered the huts of the Esquimaux, whose dogs they esteemed a regular prize, and very speedily devoured them. The natives catch them by traps formed of little sheds of ice, at the entrance of which is a portcullis of the same material, connected in such a manner with the bait within, that when the latter is seized by the animal the suspended portion drops, and the wolf is taken. Their tenacity of life is such, that after apparent death they often revive and occasion danger. The Arctic fox, a small beautiful white animal, with woolly hair like a little shock-dog, occurs in still greater numbers. About a hundred were caught in Captain Parry's second voyage, some of which were half tamed and made pets of; while others, by a harder fate, were dressed for table; and their flesh, somewhat resembling kid, afforded an agreeable relief from the constant use of salted meat.

The dog, however, is the most important quadruped of the Arctic world, and the most valuable possession of its people, who have succeeded in taming and rendering it equally useful for draught and for hunting. Those of the Greenlander, the Esquimaux, and the Kamtschadale, are large, and of a somewhat wild aspect. Captain Lyon describes them as resembling in form the shepherd's dog, rising to the height of the Newfoundland, but broad like the mastiff; having short pricked ears, a furry coat, and a bushy tail. In general they are observed to bear a strong resemblance to the wolf, and the opinion is even prevalent that the former exhibit only the latter in a tame state. Parry and

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Richardson both mention instances in which domestic dogs were seduced away by the attractions of female wolves; yet the avidity with which the wolf devours his supposed brethren does not seem quite consistent with so close an affinity. Nature, with provident care, defends them against the cold, not only by a profusion of long hair, but by a soft downy covering, formed beneath it at the commencement of winter, and shed at the approach of the milder season. The Esquimaux are much reproached for their harsh treatment of these valuable servants; yet, when young, they are used with tenderness, the women often taking them into bed, and feeding them from their own mouths. As soon as they can walk they are yoked to a small sledge; in endeavouring to shake off which encumbrance they learn to draw it. Severe and frequent beatings, however, are necessary to train them for acting as a regular team. But their greatest sufferings respect the want of food; of which, during the season of scarcity, they obtain a portion barely sufficient to maintain life, and not at all to prevent them from falling into a state the most meagre and debilitated. Their hunger is manifested by the nature of the substances with which they sometimes seek to assuage it. Captain Parry saw one which ate a large piece of canvass, a cotton handkerchief laid out to dry, and a piece of a linen shirt. The Esquimaux, we must recollect, are subject to painful scarcities, and the food of the dogs being the same with their own, the animals, on such emergencies, can scarcely expect to be placed on a footing of equality. But this rough usage does not seem incompatible with a certain degree of attachment and commiseration. For example, they refused to sell them to the English, till assured that they would not be killed. They rejoiced greatly to see a house built for them; and at every visit a friendly recognition took place between each dog and his old master. When these animals are yoked in the sledge, a whip of twenty feet long enforces obedience; while

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peculiar cries indicate the right or left, to turn or to stop. Three dogs can draw a sledge weighing 100 lbs. at the rate of a mile in six minutes, and one leader is said to have transported 196 lbs. the same distance in eight minutes. A full team, however, comprises eight or ten; though seven have been known to draw a loaded sledge at the rate of a mile in four minutes and a half; while nine, employed in conveying stores from the Hecla to the Fury, drew 1611 lbs. in nine minutes. Captain Lyon reports most favourably of the team that he himself formed, which used to carry him from ship to ship, a mile distant, in the deepest darkness and amid clouds of snow-drift, with the most perfect precision, when he could not have found his own way a hundred steps. Their services in hunting are also of great value; they can snuff the seal in his hole, or the deer on the mountains, from a surprising distance. Assembled in packs, they face even the Polar bear, keeping him at bay till their masters come up with spears to the attack.

The air in those dreary regions is, almost as much as the waters, peopled with its appropriate inhabitants, which fill it continually with sound and life. Here, too, the species are nearly all different from those that wing their flight through the temperate skies. They do not shine with the bright hues of the humming-bird, nor breathe the soft notes of the nightingale, nor do they charm the ear with the rich melody of our woodland choirs; but the auk, the petrel, and the gull, clustering in myriads, cause all the rocks and shores of the North to echo with their wild clang. They are almost all rapacious and carnivorous; the vast collections of shell-fish and marine insects with which those seas abound, and the carcasses of the huge animals that are killed, either in conflicts with each other or with man, affording them an inexhaustible supply of nutriment.

The fulmar, or petrel (*Procellaria glacialis*), is the close attendant of the whale-ships in every stage of their progress. Termed emphatically the bird of storm,

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it faces the northern tempest when raving with its utmost fury, and seats itself on the agitated crest of the mountain-wave as calmly as if resting on the surface of an untroubled lake. It follows with one uniform object,—that of snatching and feasting on portions of blubber. As soon as a whale is fastened to the side of the ship, and begins to be cut up, an immense muster takes place, sometimes exceeding a thousand, all stationed in the rear, watching for the fragments which are wafted to leeward. The peculiar chuckling noise by which they express their eager expectation, the voracity with which they seize on the fat, and the huge morsels which they swallow,—the envy shown toward those that have obtained the largest of these delicate morsels, and often the violent measures taken to wrest it from them,—afford to the sailors a variety of amusing scenes. The surface of the sea is occasionally so completely covered with them, that a stone cannot be thrown without one being struck. When an alarm is given, innumerable wings are instantly in movement, and the birds, striking their feet against the water to aid their flight, cause a loud and thundering plash.

The petrel, however, does not enjoy alone this delicious ocean-festival. It is sought with equal avidity by the various species of the *Larus* or gull,—the Arctic gull, the kittiwake, and the snow-bird (*Larus eburneus*), which last excites admiration by the pure and beautiful white of its plumage; but the elegance of its taste does not correspond to that of its appearance, fat blubber being its choicest luxury, while it utters a loud and disagreeable scream. All these ravening tribes of the northern sky, however, have a terrible rival in the blue gull (*Larus glaucus*), which, while it equals them in rapacity, surpasses them all in strength. In consideration of this, the Dutch have invested him with the title of *burgomaster;* but that sage magistrate uses, we trust, his power in a very different manner from his winged representative, who employs it solely in wresting from the weaker species whatever he sees them possess, and

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esteems desirable. He is usually hovering high in the air, or seated on the loftiest icy pinnaclés, whence, having fixed his eye on a dainty morsel, he darts down on the possessor, which, whether fulmar, snow-bird, or kittiwake, must instantly resign the coveted prize. Happily for these races the burgomaster class is very small in number, compared to the multitudes over whom he tyrannizes.

The genus *Anas*, comprehending the swan, the goose, and the duck, large, useful, and often beautiful fowls, traverse in vast flights all the northern seas and inlets. Like the rest of the *Anseres*, they have all webbed feet, consisting of branching toes connected by a membrane, which enable them to move with equal facility on the water as on land. The swan, with its stately plumage, frequents chiefly the inland seas and lakes, of which it has been called the peaceful monarch. The goose, a less elegant but more valuable bird, migrates in vast numbers every spring to breed on the Arctic shores and islands, and affords a valuable supply of food to all the northern settlements. The Hudson's Bay Company salt three or four thousand annually for winter. The Indians celebrate the month of their arrival under the title of the goose-moon. Migration during the rigorous season, resorted to even by quadrupeds, becomes the still more natural resource of the feathered creation. In September the flocks of geese, winging their way to the southward, supplied a warning to Captain Franklin of the winter that was closing in upon him.

The duck reaches a still higher latitude than the goose, and endures still severer cold. Great flocks of that species called the eider arrive in spring on the most northern shores of Greenland. All the birds that fly over the frozen seas are provided by nature with a rich and ample plumage, and a lining of soft down beneath; and the people of those countries find their skins, with the feathers inside, to be one of their most comfortable articles of clothing. But the down of all the other species is surpassed in fineness by that of the

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duck now named, the delicious softness of which fits it for the couch of kings. A pound of eider-down, according to Sir Charles Giesecke, is usually sold for a pound sterling. The best is that which the birds pluck from their breast to furnish the interior of their nest. The Greenlander, watching his time, removes this precious lining as soon as it is completed, whereupon the poor animals form a second, destined to share the same fate.

Among Arctic birds are included the terns, which on the American coast are so very numerous, that an island has been named from the immense flocks with which it is annually filled. They produce the most delicate eggs of any water-fowl. We may add the *Colymbus* (guillemot), whose skin affords a peculiarly comfortable clothing,—the *Tringa* (sandpiper),—the *Charadrius* (plover),—the *Tetrao* (grouse and ptarmigan), of which a species, much valued on account of the delicacy of its flesh, occupies the interior of Greenland. All ptarmigans change their colour, from mottled gray or brown in summer to pure white during the winter months. According to De Reste, the dark summer-covering is shed at the end of autumn, and a new plumage shoots out, which is white, till darkened by the warmth of the following spring,—or, to speak more accurately, a partial moult takes place towards the close of the year, during which all the coloured feathers are thrown out, and their places supplied by white ones; while in spring most of these last are again shed, to make room for others adorned by the richer and more varied hues of summer. Captain Parry saw this change go on so rapidly among the grouse on Melville Island as to be perceptible from day to day.

The *vegetable world* does not, in this dark and outer boundary of the earth, possess such an important character as the animal. Nature, without departing wholly from her ordinary laws, could not clothe with verdure a soil which during nine months of the year is frozen as hard as rock, and covered with snow many feet deep.

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The plants of more genial climates, indeed, when inserted at the commencement of the short bright summer, spring up and wear for some time a promising appearance ; but they are all nipt by the surly winter. Still, in the northern regions, especially when approaching the Arctic zone, she does employ resources similar to those by which animal life is preserved. The fir, the pine, and other trees peculiar to the climate, on being pierced, distil, not the balmy and fragrant gums of Arabia and India, but rich, thick, coarse juices, whereby their internal heat is maintained, and which, in the shape of pitch, tar, and turpentine, serve many valuable purposes. Through the cherishing influences of these juices, the lakes of North America are bordered with tall dark forests, which afford to the agricultural countries an inexhaustible supply of useful timber. Even their gloomy foliage, while the forests of the south are every autumn strewing the ground with their faded leaves, braves through the winter all the fury of the northern tempest. Before reaching, however, the inclement sky of the Arctic regions, this magnificent growth decays. Trees gradually dwindle into meagre and stunted shrubs. Beyond the Polar circle, these monarchs of the wood, if they appear at all, rise only to the height of a few feet, throwing out lateral branches. On Melville Peninsula, dwarf-willow and the *Andromeda tetragona* afford to the Esquimaux their only material for arms and utensils. Considerable quantities of drift-timber are, no doubt, frequently found on those remote shores, supposed to have floated originally from the mouths of rivers, on the Asiatic as well as the American continent.

The species which abound most in those dreary climates belong to the tribes of mosses and lichens,—the *Cryptogamia* of Linnæus, the *Acotyledones* of Jussieu. The meagre vegetation with which the surface of the earth is covered, thus appears rather as if it were an exudation from the rocks than the produce of the soil ; yet the plants now specified are not only produced in abundance, but possess a nutritious and salutary quality

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not displayed in more fortunate regions. One species of lichen (*L. rangiferinus*) forms, as it were, the main staff of life to the Laplander; it supports the rein-deer, and the rein-deer supports him. The lichen of Iceland, again, whether boiled in soup or converted into bread, is to the natives a principal part of their subsistence. Farther north, where the depth of the snow and the continuance of frost drive the inhabitants to the shore and to the use of animal food, these vegetables still afford nourishment to the various quadrupeds which they set apart for this purpose. It is also with a peculiar species of moss that they trim their lamps. The *fungus* or mushroom, that is seen to vegetate without the aid of a proper root, and the *filices* or ferns, which consist only of one spreading leaf, the middle rib of which forms all their stalk, find the means of existence even in Greenland.

The order *Algæ*, and especially the tribe of *Fuci*, comprehending nearly all the variety of marine botany, grow in vast abundance on the northern shores. These rude plants, which have little or no distinction of stem, root, or leaves, and whose fructification is often included within the substance of the frond, cover the Greenland coast with meadows under the level of the sea. The *Confervæ*, too, another division of the same order, with their numerous filaments, spring up in great abundance.

A few plants, not belonging to this imperfect order of vegetation, embellish, during the short summer, those northern fields. Indeed, at this season, under the bright influence of the sun, some of the most beautiful among the floral tribes expand their petals. The ranunculus and anemone display their rich and varied tints; several species of saxifrage put forth their flowers; and the yellow poppy has even a gaudy appearance,—so that the genus *Papaver*, which enriches the plains of Hindostan, is among the last to expire under the snows of the Pole. The nobler fruits do not ripen under this ungenial sky; yet shrubs producing delicious berries appear on the borders at least of the Arctic zone in matchless profu-

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sion. The northern Indians consider the fruit of a bush called the *Aronia ovalis* as the most agreeable food; besides which they have the strawberry, raspberry, red whortleberry, and various others. Several of these are covered beneath the first snows of winter, which are supposed to mellow them, and, when disclosed by the return of spring, the berries are seen still hanging on the branches, while the buds of the others are bursting,—the whole producing a delightful impression, unknown to those who have not witnessed the desolation that immediately preceded.

Those climates enjoy, besides, a precious boon in the plants which act as an antidote to scurvy, and which defy the severest cold of the Arctic zone. The *Cochlearia*, a thick-tufted juicy plant of extreme fecundity, is emphatically called *scurvy-grass;* and the different species of sorrel, especially the *Rumex digynus*, were found by Captain Parry flourishing under the snow at the very farthest limit of vegetation.

The extraordinary phenomenon of *red-snow*, observed by Captain Ross and other Arctic voyagers, naturally excited the greatest interest both at home and abroad. This singular tint in a substance, with which we never fail to associate an idea of the purest and most radiant whiteness, has been ascertained to result from an assemblage of very minute bodies, belonging to the class of cryptogamic plants and the natural order called *Algæ*. They form the species named *Protococcus Nivalis* by Agardh, which is synonymous with the *Uredo Nivalis* of Mr Bauer. This production seems by no means peculiar to the Arctic mountains, but occurs on limestone rocks in the island of Lismore in Scotland, as well as among the Alps and other countries of Europe. Saussure observed it so long ago as the year 1760 on Mount Breven in Switzerland, and so frequently after that period, that he expresses his surprise at its having escaped the notice of Scheuchzer and other learned travellers. Ramond, whose observations so beautifully combine the precision of science with the perception of the picturesque, found

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red snow in the Pyrenees, as did Sommerfeldt, the botanist, on the hills of Norway. In the year 1818 vast masses of the same substance overspread both the Apennines and the Italian Alps; and it is recorded, that ten years prior to that period the vicinity of Belluno and Feltri was covered to the depth of twenty centimètres with rose-coloured snow.

According to Captain Ross, the ridges on which he observed this phenomenon are about 600 feet high, and extend eight miles in length. The depth to which the colour penetrates has been variously stated by different observers. Some found that it descended many feet beneath the surface, while others never saw it spread beyond one or two inches. There is no reason to suppose that the colouring matter itself, as well as the snow, is a meteorological product, although Humboldt certainly mentions a shower of red hail which fell at Paramo de Guanacos, in South America. Moisture is no doubt essential to the production of this plant, as it is to that of all the other *Algæ;* but, when once formed, it seems to possess the power of continued vegetation, even on rocks and stones, with only an occasional supply of fluid. The propagation of minute vegetable forms, like that of animalcules, is effected, under favourable circumstances, with a rapidity of development truly astonishing; and the most probable conjecture seems to be, that snow is not the natural situation of the *Protococcus Nivalis*, but merely that, from its great tenacity of life, it can preserve its vitality on so chilly and ungenial a surface. If such be the case, it is easy to suppose how a wide expanse may be covered with this red suffusion, during the occasional flowing of the snowy waters. When once established, its particles become more numerous than the sands of the ocean; and, increasing in density from year to year, it presents at last to the astonished navigator a sight more surprising in its reality than any of the fabled wonders of an Arabian tale.

A singular coincidence has been observed by botanists to exist between a white ground and a red flower. Thus

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the rich and brilliant variety of *Anthyllis vulnaria* is only found on a chalky surface; and many of the higher orders of flowering plants show a decided tendency to produce red-coloured petals when they happen to spring up on white limestone. "How much more forcibly, then," says Agardh, "must this law operate upon plants like the *Algæ*, in which colour is an essential part." That excess of light produces the peculiar or at least prevailing colour of the snow-plant, may be said to be demonstrated by this singular fact, that the red colour gradually changes to green as it occurs more or less secluded from the action of light among the fissures of rocks, or beneath the hollows or under-surfaces of stones. This being the case, it will appear the less incomprehensible that the same plant which is produced amid the snows of the Arctic regions or the highly elevated Alps of more southern countries, should be occasionally detected, even during the heat of summer, covering the brilliant white limestone of the plains. In the last-named locality it was discovered by the Baron Wrangel in the province of Nerike, and named by him *Lepraria kermesina;* and the two supposed species have been since ascertained to be one and the same.

In concluding our notice of this singular substance, we may observe, that when the warmth of the returning sun has partially dissolved the surface of the snow, and thus contributed to the formation and development of these microscopical plants, the vivifying power of the solar light, aided by some peculiar and as yet unknown property belonging to the natural whiteness of the snow itself, is highly influential in the production of the beautiful colour by which they are distinguished.*

* Mr Scoresby conjectured that the red colour of the Arctic snow derived its origin from innumerable multitudes of very minute creatures belonging to the order *Radiata*. He had frequently observed the ice to be tinged with an orange colour, obviously resulting from an assemblage of small transparent animals of about the size of a pin's head, resembling the *Beroe globulosa* of Lamarck. Other observers have thought themselves authorized to trace the red colour to the dung of the

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little auk (*Uria alle*), which abounds on many of the barren shores of the North. But neither of these supposed causes could produce the phenomenon alluded to, as observed among the central Alps of Europe, where marine radiata and little auks are alike unknown.

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CHAPTER III.

Ancient Voyages to the North.

Voyage of Pytheas—Norwegian Expeditions; Ohthere—Colonization of Iceland—The Zeni—Quirini.

The voyages to the North, undertaken prior to the great era of maritime enterprise and the invention of the compass, were few in number, and scarcely extended into those circumpolar regions which form the special subject of the present volume. It will be enough, therefore, to take a rapid sketch of the steps by which discovery proceeded towards those remote and almost inaccessible quarters.

The Mediterranean, the shores of which constituted the first civilized portion of the West, was the quarter where European navigation originated. As Tyre, situated in the depth of that sea, was the earliest seat of commerce, Carthage, the daughter of Tyre, was doubtless the first state which undertook any extensive discoveries upon the ocean. These, however, were shrouded in deep mystery, prompted by the jealous and monopolizing temper of this people, once so powerful and opulent. The classic writers give only some slight and detached notices of the voyage of Himilco, who appears to have sailed along the exterior coasts of Spain and France, and to have reached the southern extremity of Britain. This, it is probable, was only the first of a series of voyages carried on with the view of procuring tin,—a metal rare and highly valued in those days. The Cassiterides, or Tin-islands, which appear to be Cornwall

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and the Scilly Isles combined together, were celebrated among the primitive authors of Europe.

The most distinguished of the Greek navigators who penetrated into the North was Pytheas, a citizen of Marseilles, a Greek colony, which, favoured by its situation, had become the chief emporium of the commerce of Britain, already esteemed of some importance. He seems to have been the first who, inspired by motives of intelligent curiosity, endeavoured to reach the British coast, and the remotest extremities of the sea by which it is washed. Our knowledge of this voyage is indeed imperfect, being almost entirely due to Strabo, who, while he relates it, derides the whole as a palpable forgery; yet the very particulars on which he founds this charge go far to establish the fact he questions. Pytheas appears to have passed the Straits, and sailed along the western coasts of France and Spain, which, from previous misconception, he confounds together. Thence he seems to have directed his course through the English Channel, and along the eastern coasts of Britain, till he reached the northern parts of the island. Not content with this achievement, he continued to sail onwards into the depths of ocean, till in six days he arrived at Thule, an island where it appeared to him that perpetual light reigned at midsummer throughout the night as well as the day. Immediately beyond, his progress was arrested by a barrier of a peculiar nature—by something which was neither earth, air, nor sky, but a compound of all the three; forming a thick viscid substance, through which it was impossible to penetrate. These statements have afforded much advantage to sceptical readers; yet the summer days of Shetland are really very long, and the thick and gloomy mists, with which the Northern Sea is often loaded, might make a peculiar impression on the mind of a man who had ventured into this unknown ocean so far beyond the limit of former navigation: they might make him prone to believe that he had arrived at the farthest boundaries of

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nature. It seems difficult, however, to suppose, with Bougainville, that he proceeded as far as Iceland; though there is little doubt that he entered the Baltic, and also brought home a correct account of its shores, then known to the people on the Mediterranean almost solely by the qualities of the amber which was thence imported.

The enterprise of Pytheas, though apparently quite authentic, did not lead to any change in the course of the Massylian trade. It was probably found both cheaper and more convenient to transport the productions of Britain through Gaul, than to convey them by means of such a lengthened and perilous voyage. The only other additions to ancient knowledge respecting the northern seas were made by the Romans, who, in order to conquer, were obliged to explore the earth. Agricola, before undertaking the campaign which was to reduce Scotland into a province, sent fleets to explore its most northern shores and bays. His countrymen, however, do not appear to have sent in that direction, nor perhaps in any other, naval expeditions having discovery alone for their object. Their delineation of Caledonia itself is excessively rude; and though they had traced the shores of Europe eastward as far as Russia, the great peninsula of Scandinavia appeared to them only as a cluster of islands.

In the decline of the Roman empire, that country, formerly so little regarded, became the seat of a most formidable maritime power. Norway, under the terrible dominion of Harold the Fairhaired, Denmark, under Gorm and Canute, sent forth fleets which pillaged all the coasts of Europe, and reduced many of them to subjection. Their movements, however, were *from* the North, not *to* the North; and their objects were not science, but ravage and conquest. The Runic tribes, indeed, were not without some tincture of letters and poetry; though their *sagas* or poetical chronicles celebrated only the exploits of their mighty sea-kings and rovers, not any undertaking connected with commerce and the arts of peace. Yet a communication with these adventurers

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enabled Alfred, that illustrious monarch, to collect information respecting those extremities of the earth which had remained unknown to the Greeks and Romans. Ohthere, a chief who had come from the upper tracts of Norway, afforded some intelligence respecting a voyage performed by himself along the Arctic shores of Europe.

This traveller was considered a rich man in his own country, being owner of twenty oxen, twenty sheep, and six hundred tame rein-deer. Fired by a spirit of liberal research, he put to sea in order to discover the regions that lay northward of the high latitude in which his domain was situated. He sailed six days in that direction, at the end of which he appears to have reached the North Cape, the farthest point of Europe; he then turned three days towards the east, and afterwards five days to the south. All this while the land on his right was desolate, traversed only by a few wandering shepherds and hunters of Finnish race. Then, however, he reached a large river, the opposite side of which was somewhat densely inhabited by the Biarmians, or people of Northern Russia, who showed such a hostile disposition as obliged him to return. The fishery of the horse-whale (walrus) was found to be carried on here with so great advantage, that many individuals were afterwards induced to repair thither. Forster delineates the course of Ohthere as extending to the interior of the White Sea: but we do not think the period of eight days from the North Cape could have carried him farther than the river Kola, which agrees also with the supposition of his having been arrested on the frontier of Russian Lapland.

In pursuing their favourite objects of conquest and plunder, the Northmen always bent their sails towards the south. To quit their bleak regions in search of others still more bleak, would have been wholly foreign to their views; yet, as the sea was covered with their ships, chance and tempest sometimes drove them in an opposite direction. In 861, Nadodd, during a piratical

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excursion, unexpectedly discovered Iceland; and though this country had little to tempt a nation of freebooters, it so chanced that there existed materials for its colonization. Harold, in making himself master of all Norway, had deprived of their rights and domains numerous petty chieftains, and thereby created a large body of malecontents. But he was willing to grant, and they to accept, a permanent refuge in this frozen clime; and, accordingly, successive bands of emigrants proceeded thither, where they were organized into a free and independent community. They even crossed to the opposite coast of Greenland, and formed settlements, which for some time were tolerably flourishing, though they have since either perished or lost all communication with the parent state. During the eleventh century, however, chance or enterprise led them southward to another coast, which they called Vinland, and which has been very generally believed to be America, though, after a careful examination of the authorities on which this opinion rests, we are satisfied that the new country was merely a more southern point of Greenland. The limits of the present work, however, will not admit any detailed account of these settlements.

The republican cities of Italy, during the middle ages, revived the fainting spirit of commerce and navigation, which they raised to a degree of prosperity, equal, probably, to that attained by Tyre and Carthage during the height of their ancient glory. Their trade, however, lay chiefly within the Mediterranean, especially its eastern border, whither were brought overland, or by the Red Sea, the commodities of India. Few were disposed to quit this bright and golden track to face the tempests of the northern ocean; yet were there not wanting some adventurous spirits who incurred all the hazards of penetrating into its remote and dangerous waters.

Nicolo Zeno, a noble merchant of Venice, undertook, in 1380, a voyage to Flanders, during which a tempest drove him upon a coast that he calls Friesland. The

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position of this unknown shore has been a subject of controversy; and some have even had recourse to the hypothesis of its having been since swallowed up by the ocean. When, however, we find that Friesland was in fact a cluster of islands, to which are applied the names, Talas, Broas, Bres, Iscant, easily converted into Zeal, Brassa, Unst, we may conclude with Forster that it was probably one of the Shetland Isles. Being cast ashore in a state completely destitute, he was received with great kindness by the Prince Zichmni; who, finding him eminently skilled in naval affairs, reposed in him the highest confidence, and placed under his command various expeditions. So pleased was the Venetian with the favour of this northern potentate, that he invited his brother Antonio to join him. The only voyage, however, which seems to have carried him far to the north, was one to Greenland, and he gives a somewhat romantic account of a religious establishment already formed in that country. The convent was built on the side of a hill, whence burst a copious spring, whose boiling waters enabled the monks to vanquish all the evils of the climate. When spread on the frozen soil, it contributed to the production of the most useful herbs and culinary plants; and when introduced into the houses, it served for warming the apartments and cooking the victuals. They were likewise supplied from the country with abundance of fish, rein-deer, and wild-fowl; and vessels from Norway brought to them the luxuries of life. Zeno performed other voyages in a different direction, which have even been supposed to reach as far as America: but we incline to think that the notices which have suggested this conclusion are partly misunderstood and partly interpolated.*

Quirini, another Italian nobleman, in 1431, engaged in a similar enterprise, and was likewise driven by a tempest on the coast of Norway. The crew arrived in

* A recent writer views the whole narrative as a complete forgery,—a conclusion to which we are not willing to accede.

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the most miserable plight, having lost the ship, and been obliged to take to their boats, after the greater part of them had perished by hunger, cold, and thirst. They were thrown first on a small uninhabited island, where, having erected two tents, and found a large fish, they contrived to support life. After some days, a fisherman and two boys coming in a boat to the island, were at first terrified at the sight of the strangers; but, by soothing language and importunity, were at length prevailed upon to take with them two of the sailors,—Gerard of Lyons and Cola of Otranto. They rowed to a village on the neighbouring island of Rost, where they met the kindest reception; and, as it chanced to be Sunday, the priests exhorted the congregation to afford all the assistance in their power to these unfortunate strangers. Six boats were fitted out, the appearance of which filled Quirini with joy; and his satisfaction was still farther increased by receiving a supply of bread and beer, as well as a cordial invitation to proceed with his deliverers to Rost. He and his people were treated with uninterrupted kindness during a stay of three months, in which time they completely recovered from all their distress and fatigue. The natives of this little island, about 120 in number, subsisted on salt fish, which they carried to the market of Bergen, where purchasers arrived from Germany and other countries; also on sea-fowl, which in vast flocks covered all the surrounding rocks, and even built on the sides of the houses. Many of these birds were so tame that, when the natives walked up to their nests, they were wont to step off, allow two or three eggs to be taken, and then resume their seat. The people were most strict in their attention to religious duties, and carried their resignation to the will of Providence so very far that they rejoiced, and sometimes even held a festival, at the death of near relations. The Italians, accustomed to the feelings of southern jealousy, were extremely surprised to see all the members of a family sleeping together in one apartment, which they themselves were permitted to share

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without the remotest feeling of impropriety. In summer, both sexes walked naked to the nearest pool, and bathed promiscuously, all in perfect innocence, and without awakening any suspicion,—a practice, indeed, which pretty generally prevails in the northern countries of Europe at the present day.

The summer having arrived, Quirini took occasion to go with the annual ship to Drontheim, and, travelling thence by land to Sweden, he found a vessel bound for Rostock, in which he finally returned to Italy by way of England.

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CHAPTER IV.

Voyages in Search of a North-east Passage.

Rise of Maritime Enterprise in England—Plan of a North-east Passage to India—Expedition of Sir Hugh Willoughby; its Issue—Chancelor reaches the White Sea; Journey to Moscow—Voyage of Burroughs—Of Pet and Jackman—Dutch Expeditions—Barentz's First, Second, and Third Voyages; His Death—Hudson—Wood—Litke.

THE latter part of the fifteenth century may be fixed upon as that period in the history of the world when maritime discovery was prosecuted on the greatest scale, and with the most splendid results. Travellers and navigators of the present day have displayed an enterprise which cannot be exceeded; but there remained for their efforts only the distant boundaries of ocean, or the interior of barbarous continents. On the contrary, vast kingdoms, new worlds, regions teeming with unbounded wealth, rewarded the daring career of Gama and Columbus. A new direction was given to human ambition and industry; and the discovery of distant regions became not only a commercial speculation with individuals, but one of the grandest objects of national policy.

England had always shown herself ready to embark in every scheme of adventure and utility; yet she was not altogether prepared for these extensive undertakings. The nations of southern Europe were then nearly a century in advance of those ruder states which lay behind the Alps and the Pyrenees. Venice, Genoa, Seville, Lisbon, and not London or Amsterdam, were

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the great schools of commerce and navigation. The habits and ideas of the feudal system, its proud indolence and contempt of mechanical pursuits, were only in the course of being superseded; and the mercantile interest possessed as yet only a small share of that importance to which it has since attained.

Henry VII., amid these unfavourable circumstances, and with nothing of the heroic or adventurous in his composition, possessed qualities which enabled him to appreciate the advantages of maritime discovery. Every thing which promised to fill his coffers was congenial to his taste; and for this reason he showed himself ready to meet the views of Columbus with greater zeal than any other monarch of the age. That great navigator, after vain solicitation at the courts of Spain and Portugal, sent his brother Bartholomew to make propositions to the English sovereign, which were very favourably listened to; but before his messenger returned to Castile, the Genoese captain, under the auspices of Isabella, was already crossing the Atlantic. It was afterwards with the countenance of Henry, though not at his expense, that John Cabot, in 1497, made that important voyage in which he discovered Newfoundland,—an island which, though not fitted for culture, has become the seat of one of the greatest fisheries in the world. He was also the first European who came into contact with any part of the American continent. The same prince, in 1498, furnished to him the means of fitting out another expedition, which appears to have been conducted by his son Sebastian. He subsequently granted to Richard Warde, Thomas Ashehurst, and John Thomas, merchants of Bristol, in conjunction with three natives of Portugal, letters-patent, to undertake the discovery of lands and regions unknown; but the result of their expedition is not recorded.

Notwithstanding these proceedings, England had not yet thoroughly imbibed the true spirit of maritime enterprise. Kindled at a foreign shrine, the flame, when deprived of external support, gradually lan-

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guished ; and it became nearly extinct during the long reign of Henry VIII. Considering the character of this despot, full of bustle, needy of money, and not devoid of intelligence, he might have been supposed rather prompt to embark in such undertakings ; but, involved in numerous disputes, domestic and theological, and studying, though with little skill, to hold the balance between the two great continental rivals, Charles and Francis, he was insensible to the glory and advantages to be derived from naval expeditions.* Sebastian Cabot, in order to obtain employment, was obliged to quit England and repair to Spain, where he was received with much favour, and spent the greater part of his life, either in attempts at discovery, or in a quiet residence at Seville, where he was consulted and revered as a nautical oracle.

After a long slumber the maritime genius of England

* This passage has drawn forth the indignation of a late author (Memoir of Sebastian Cabot, Lond. 1831), who represents the writer of this department of the work, in conjunction with his illustrious predecessors, Robertson and Forster, as wholly disregarding "the evidence which strikingly evinces the earnest and continued exertions of Henry VIII. in reference to this project" (p. 281). Yet his utmost research has only proved that this prince, in the course of a reign of thirty-eight years, while all Europe was filled with the enthusiasm of maritime discovery, fitted out *two* expeditions, both seemingly in compliance with very urgent representations. Mr Thorne, the chief English promoter of naval discovery, entirely concurs with us when he says to Henry, in a letter written during the eighteenth year of his reign, "Perceiving that your Grace may at your pleasure, to your greater glory, by a godly meane, with little cost, perill, or labour to your Grace or any of your subjects, amplifie and inrich this your sayd realme, I know it is my bounden duety to manifest *this secret* unto your Grace, *which hitherto, as I suppose, hath beene hid.*"—Hakluyt, i. 213. The single expedition fitted out in the course of the succeeding twenty years could not materially alter the character of Henry as a promoter of discovery. A consideration of the simple fact, that Sebastian Cabot, during nearly the whole reign of this monarch, was obliged to seek patronage in a foreign country, is surely decisive as to his pretended zeal in the cause of discovery. There does not therefore appear the slightest ground for any alteration in the passage as it stands in the text.

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was suddenly roused; bursting forth under a young prince of high hope and promise. In 1553, the sixth year of the reign of Edward VI., the merchants of London, among whom are said to have been "men of great wisdom and gravity," felt an unwonted and extreme ardour in the cause of discovery. There chanced at that critical moment to be in their city no less a person than Sebastian Cabot, with whom they entered into deep consultation, and with his assistance formed the general plan of a voyage, having in view to reach, by way of the north and north-east, the celebrated regions of India and Cathay. The obstacles to such an undertaking could not yet be fully appreciated; no just idea having been formed of the immense breadth of Asia, its extension towards the north, and the enormous masses of ice with which its shores are encumbered.

The youthful monarch, whether he had any influence in inspiring this general ardour, or whether he caught the flame from his people, showed the most eager interest in the cause. He had already named Sebastian grand pilot of England, with a salary, considerable in that age, of £166. It was not by royal munificence, however, that the funds were supplied for prosecuting this arduous enterprise. An association, or senate as it is called, was formed, who judged it most advisable to divide the concern into shares of £25, by which means the sum of six thousand pounds was easily raised, and employed in the construction and equipment of three vessels fitted for northern navigation. The preparations, with a due regard to the formidable character and length of the voyage, were made on a scale of which there had been no previous example. Cabot says, "The like was never in any realm seen, used, or known." The timbers were made of extraordinary strength, by the best shipwrights; the keel was covered with thin sheets of lead, —a contrivance then practised for the first time,—and provisions for eighteen months were put on board. The grand pilot, though unable, probably from his age, to

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accompany the expedition, drew out a series of instructions, in which the whole conduct to be observed by the officers and crew is minutely laid down. He enjoins strict attention to morals; that morning and evening prayers be read on board each ship, either by the chaplain or master; and that there be no "ribaldry or ungodly talk, dicing, carding, tabling, nor other devilish games." He prohibits all acts tending to the breach of discipline, "conspiracies, part-takings, factions, false tales, which be the very seeds and fruits of contention." Naval subordination being in that age only imperfectly established, and the tendency to mutiny very strong, these exhortations were most seasonable. All questions respecting the steering of the ship were to be decided by a council of twelve, the captain having only a double vote. Persons skilled in writing were, in each vessel, to keep a daily record of the course of navigation, the celestial observations, the aspect of the lands along which they sailed, with every other interesting occurrence. The different masters were to meet weekly, compare these records, and enter the result in a common ledger. Directions were even given for adjusting weekly accounts, keeping the cook-room and other parts of the ship clean, and preventing any liquor from being spilled upon them. The natives of the countries which they visited were "to be considered advisedly, and treated with gentleness and courtesy, without any disdain, laughing, or contempt." Particular endeavours were to be made by fair means to allure some one on board, where he was to be well clothed and treated, so as to attract others; but we cannot so much applaud the hint, that "if he be made drunk with your wine or beer, you shall know the secrets of his heart." The mariners are exhorted, however, to use the utmost circumspection in their dealings with these strangers, and, if invited to dine with any lord or ruler, to go well armed, and in a posture of defence. The liveries furnished to the sailors were to be carefully kept by the mercantile agents, and to be worn only when their

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captain considered it an object to show them "in good array for the advancement and honour of the voyage." He warns the mariners not to be too much alarmed when they saw the natives dressed in lions' and bears' skins, with long bows and arrows, as this formidable appearance was often assumed merely to inspire terror. However, he seems to suggest a still more chimerical fear, when he tells them that there are persons armed with bows, who swim naked, in various seas, havens, and rivers, "desirous of the bodies of men, which they covet for meat," and against whom diligent watch must be kept night and day. We know not whether some confused rumour of the shark and alligator had an influence in suggesting this strange precaution.

It now became necessary to elect a suitable commander, and many offers were made both by persons qualified and unqualified. The choice for the supreme direction fell on Sir Hugh Willoughby. His recommendations, as mentioned by Adams, were high birth, tall and handsome person, valiant conduct and skill in war,—merits probably enhanced by admiration of the heroism which impelled him to engage in this new and daring career. No mention being made of nautical experience, it may be suspected that, amid so many brilliant qualities, this most essential requisite was not duly taken into account. The charge of the next vessel was confided to Richard Chancelor, an *élève* of Henry Sidney, father of Sir Philip, and who first gave lustre to that great name. Sidney stood high in the favour of the king, and was animated with the most ardent zeal for the promotion of the voyage. Chancelor is specially commended for "the many good parts of wit in him," tending to inspire the most sanguine hopes of his success.

The preparations being completed, Edward drew up a letter addressed to all "kings, princes, rulers, judges, and governors of the earth;" which, if composed by himself, certainly reflects very considerable credit upon his spirit and judgment. He observes to these unknown

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potentates, that "the great and Almighty God hath given unto mankind, above all other living creatures, such a heart and desire that every man desireth to join friendship with other, to love and to be loved, also to give and receive mutual benefits." He represents, therefore, the duty of showing kindness to strangers, and especially to "merchants, who wander about the world, search both the land and the sea, to carry such good and profitable things as are found in their countries to remote regions and kingdoms." With this view, it is stated that a valiant knight, Sir Hugh Willoughby, and other trusty and faithful servants, had departed from England. "We therefore desire you, kings and princes, and all other to whom there is any power on earth, to permit unto these our servants free passage by your regions and dominions, for they shall not touch any thing of yours unwilling unto you." If such kindness were shown, he concludes, "We promise, by the God of all things that are contained in heaven, earth, and the sea, and by the life and tranquillity of our kingdoms, that we will with like humanity accept your servants, if at any time they shall come to our kingdoms."

It was judged inexpedient to delay the sailing of the vessels beyond the 10th of May, lest they should be overtaken by winter in the northern latitudes. All the members of the expedition took a solemn and tender leave of their relations, kindred, and "friends dearer than kindred," and were at their station on the appointed day. Early in the morning they dropped down from Ratcliffe to Greenwich, where the court, and, as it were, the nation, were assembled to witness their departure. The king himself was confined by illness, but the principal courtiers stood at the palace-windows, the rest of the household mounted the towers, while the people in crowds lined the shore. The ships fired their guns, causing the hills and valleys to resound; and "the mariners shouted in such sort that the sky rung with the noise thereof. In short, it was a very

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triumph." The thought of the distant and unknown seas, into which they were so perilously plunging, was either forgotten in this moment of exultation, or served only to heighten its enthusiasm.

The expedition, which consisted of three vessels, after stopping a few days at Blackwall, sailed down to Gravesend, and thence to the coast of Essex, where contrary winds unfortunately detained them till the 23d. Then, with a favouring gale, they quitted England and shaped their course into the open expanse of the German Sea; the sailors fixing their eyes on their native land as it gradually receded, and many, unaccustomed to these distant voyages, dropped a few natural tears at the thought that they were seeing it perhaps for the last time.

Sir Hugh was desirous of touching at the coast of Scotland; but this was rendered impossible by contrary winds, which obliged him also to make frequent changes of course, "traversing and tracing the seas." On the 14th July he found himself involved in that labyrinth of isles which stud the coast of Norway between the 66th and 68th degrees of latitude. The ships then altered their course and proceeded till they came to the larger range of the Lofoot (Loffoden) Isles. The people, subject to Denmark, were gentle and courteous; but the English, evidently ignorant of this coast, sought in vain to learn how these islands were situated with regard to the Norwegian shore. They proceeded onward to the large island of Seynam or Senjan, where they endeavoured without success to procure a pilot. They were now approaching the North Cape, and saw before them the abyss of the Arctic Ocean stretching onwards to the Pole, and soon to be filled with snows and tempests. In this critical conjuncture Sir Hugh assembled the commanders, and exhorted them to keep close together; but, in case of separation, appointed their rendezvous at Wardhuys, understood to be the principal port of Finmark. The wisdom of this precaution soon appeared; for, before

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they could enter a harbour, there arose such "flaws of wind and terrible whirlwinds," that they were obliged to stand out to the open sea, and allow the vessels to drift at the mercy of the waves. Amid the thick mists of the next stormy night the two principal ships separated, and never again met. Clement Adams, who was with Chancelor, says, that as they were driving before the gale, the admiral loudly and earnestly called upon them to keep close to him; but that he himself carried so much sail, and his vessel was so superior, that the other could not possibly obey this order. Willoughby's pinnace was dashed to pieces amid the tempest; and next morning, when light dawned, he could see neither of his companions; but, discovering at length the smaller vessel called the Confidence, he continued his voyage. He now sailed nearly two hundred miles north-east and by north, but was astonished and bewildered at not discovering any appearance of a shore; whence it was manifest that "the land lay not as the globe made mention." The imperfect maps of those days appear not to have shown that rapid bend towards the south which the coast takes near the great opening of the Waranger Fiord, on which Wardhuys is situated. Instead, therefore, of approaching the borders of Norway, he was plunging deeper and deeper into the abysses of the Northern Ocean. At length the soundings, indicating a depth of 160 fathoms, proved that, as the navigators were out at sea, they must have fallen into some great and perilous error. They then for some time steered to the south-east, yet afterwards again turned to the north, and continued shifting their courses amid doubt and uncertainty. As they groped their way in this manner through those vast and stormy seas, land at length appeared, but high, desolate, and covered with snow, while no sound could be wafted over the waves except the crash of its falling ice, and the hungry roar of its monsters. This coast was evidently that of Nova Zembla; but there was no point at which a landing could

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be made. After another attempt to push to the northward, the mariners became sensible that Norway must be sought in an opposite direction. They turned to the south-west, and having followed that course for a number of days, saw the coast of Russian Lapland. At this point they must have been very near the opening of the White Sea, into which had fortune guided their sails, they would have reached Archangel, have had a joyful meeting with their comrades, and spent the winter in comfort and security. An evil destiny led them westward, in the hope, probably, of reaching Wardhuys, the only point in those immense seas of which they had any distinct knowledge. The coast was naked, uninhabited, and destitute of shelter, except at one point, where they found it bold and rocky, but with some good harbours. Here, though it was only the middle of September, they felt already all the rigours of a northern season; intense frost, snow, and ice, driving through the air as though it had been the depth of winter. For these reasons, the officers conceived it inexpedient to search any longer along those desolate shores, but to take up their quarters in this haven till the ensuing spring. They were surprised by the appearances of rein-deer, foxes, Polar bears, and "divers beasts to them unknown, and therefore wonderful."

The narrative here closes, and the darkest gloom involves the fate of this first English expedition, for neither the commander nor any of his brave companions ever returned to their native land. After long suspense and anxiety, tidings reached home that some Russian sailors, as they wandered along those dreary tracts, had been astonished by the view of two large ships, which they entered, and found the gallant crews all lifeless. There was only the journal of the voyage, with a note written in January, showing that at that date they were still alive. What was the immediate cause of a catastrophe so dismal and so complete,—whether it was the extremity of cold, famine, or disease, or whether

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all these ills united at once to assail them,—can now only be a matter of sad conjecture. Thomson thus pathetically laments their fate :—

> Miserable they,
> Who, here entangled in the gathering ice,
> Take their last look of the descending sun ;
> While full of death, and fierce with tenfold frost,
> The long long night, incumbent o'er their heads,
> Falls horrible. Such was the Briton's fate,
> As with *first* prow (what have not Britons dared !)
> He for the passage sought, attempted since
> So much in vain.———

We must now advert to the fortunes of Chancelor, with whom we parted amid the tempests which overtook the ships on the farthest shores of Norway. This commander pressed on, and, by keeping close to the land, or by obtaining better information, succeeded without any difficulty in reaching Wardhuys. There he waited for his companions seven days ; after which, disregarding the alarming representations of the natives as to the dangers of the wild ocean which beats on their coast, he again set sail. "He held on his course towards that unknown part of the world, and sailed so far that he came at last to the place where he found no night at all, but a continual light and brightness of the sun, shining clearly upon the great and mighty sea." As it was now the month of August, it seems difficult to comprehend how the perpetual light of the northern midsummer should not have been perceived sooner, and that it should now be ascribed to the progress eastward. Probably a course of gloomy weather had preceded, so that, at this period, it became for the first time sensible. By this means, however, the adventurers were guided to the entrance of an immense bay, which was no other than the White Sea, as yet unknown to Western Europe. They espied a little fishing-boat, the crew of which, having never seen a vessel of similar magnitude, were as much astonished as the native Americans had been at the Spaniards, and taking the alarm, fled at full speed.

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Chancelor, with his party, pursued and overtook them; whereupon they fell flat on the ground, half-dead, crying for mercy. He endeavoured in the most soothing manner to relieve their apprehensions, and by looks, gestures, and gifts, expressed the kindest intentions. Upon being allowed to depart, they spread every where the report of the arrival "of a strange nation, of singular gentleness and courtesy." The natives came in crowds, and the sailors were plentifully supplied with provisions and every thing they wanted.

Chancelor now, inquiring on what part of the world he had been thrown, learned that he was at the extremity of a vast country, then obscurely known in Britain by the title of Russia or Muscovy, and which was under the absolute rule of a sovereign named Ivan Vasilovitch. Although the court at Moscow was immensely distant, and could only be reached by sledges over the snow, he sought and at length obtained permission to visit the capital of this great potentate. His journey to that city carrying him out of the sphere of Arctic discovery, it will suffice to say, that he was received in the most satisfactory manner, and returned with a letter from the czar, expressing a cordial desire to open an intercourse with England, and to grant to the Merchant-adventurers every privilege necessary to enable them to carry on traffic in his kingdom. Those traders now assumed the title of the Muscovy Company; and the same officer was again sent out with credentials from Philip and Mary, who, in consequence of the premature death of Edward, then filled the throne. The original object of finding an eastern passage was not lost sight of; the captain being instructed to make every possible inquiry on the subject. The spirit of discovery at home was too ardent, however, to wait his return; and a small vessel, called the Searchthrift, being fitted out in 1556, was placed under the command of Stephen Burroughs, who on the first voyage had acted as master of Chancelor's vessel. Enthusiasm and hope seem to have risen as high as at the

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departure of the former expedition. Sebastian Cabot went down to Gravesend with a large party of ladies and gentlemen, and, having partaken of such cheer as the ship afforded, invited the navigator and his company to a splendid banquet ashore. After dinner, a dance being proposed, the venerable pilot started up and tripped it along with the most youthful of the party.

Under these cheerful auspices, the Searchthrift, on the 29th April, sailed from the Thames; but various circumstances delayed, till the middle of July, her arrival at the islands and straits of Waygatz between Nova Zembla and the continent. On the 21st the crew saw what they imagined to be land, but it proved to be a "monstrous heap of ice, which was a fearful sight to see." They were soon entangled in it, and for six hours could with difficulty avoid one mass without striking upon another. Soon afterwards an immense whale came so close that they might have thrust a sword into him; but, alarmed lest he should overset the vessel, Burroughs called together his men, and caused them to shout with all their might; upon which this mighty animal, which is neither fierce nor very courageous, plunged into the depths with a terrible noise.

Among the islands of Waygatz they descried a Russian sail. The master, named Loshak, seemed willing to avoid them, under the pretext that he was in extreme haste; but, on receiving a glass, two pewter spoons, and two knives, he presented seventeen wild geese, and gave much information. He told them that they were on the coast of the wild Samoiedes, who owned no subjection to the czar, but "will shoot at all men to the uttermost of their power that cannot speak their speech;" it was even said that they ate the Russians. He then conducted Burroughs to a place left by these people, where there were still three hundred of their idols, the rudest workmanship he ever saw. They consisted of figures of men, women, and children, "very grossly wrought; the eyes, mouths, and other parts, stained with blood." We may here mention that Johnson, one of the party, when at

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the Pechora, had been present at a mighty scene of magical incantation, performed by one of the great northern wizards. This personage first took a great sieve, somewhat resembling a drum, then he began to sing "as we use in England to halloo, whoop, and shout at hounds," to which the company responded with—*igha, igha, igha!* At length the magician fell into convulsions, and dropped down as if dead, though he could still be heard breathing. The visiter having asked the meaning of all this, was told—"Now doth our God tell him what we shall do!" Having thus allowed him to remain for a short time, the people began to cry *aghao, aghao!* whereupon he rose and again began to sing. He next took a sword and thrust it through his body, causing it to enter at the breast and issue at the back. Johnson saw it go into the shirt before and come out at the shirt behind, but does not seem to have scrutinized with any diligence its actual passage through the person. The magician then sat down with a vessel of hot water before him, and a line or rope of deer-skin passed round his body, over all which, as well as himself, a spacious mantle was spread. The ends of the line being left outside the robe, were drawn tight by two men, till something was heard falling into the dish. The Englishman, asking what this was, learned with horror that it was the magician's head, shoulder, and left arm, severed from the body by the violent pulling of the rope. He entreated that he might be allowed to lift the cloak and view this awful spectacle, but was assured that no one could do so and live. After the multitude had sung and hallooed for some time, the covering was removed, when the wizard came forth perfectly entire, all the parts cut asunder having it seems been miraculously replaced. This imposture, however gross and obvious, appears to have completely succeeded with the ignorant natives.

Burroughs had passed fifteen leagues beyond the mouth of the Pechora, and the soundings indicated an approach to Nova Zembla, when he came to the conclusion that all attempts to penetrate farther this year would be

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abortive. Among other causes, he mentions the untoward north and north-easterly winds, which were more powerful than in any other place he ever knew; the great and terrible abundance of ice, of which he had reason always to expect greater store; the nights waxing dark, and Winter with his storms beginning to draw on. Under these considerations he determined to return and pass the gloomy season at Colmogro, stating his intention to resume next summer the attempt to penetrate eastward; but this, in consequence of other employment, was never carried into effect.

There occurred now a tragical incident connected with northern discovery. The czar, Ivan Vasilovitch, sent with Chancelor an ambassador and orator, as he is termed, Osep Nepea Gregorowitch, in charge of four ships heavily laden with furs, wax, train-oil, and other Russian commodities, to the value of upwards of £20,000, which belonged partly to the merchants and partly to the imperial envoy himself. On this homeward voyage, two of the vessels were wrecked on the coast of Norway, a third reached the Thames, but the Edward Bonaventure, in which the chiefs of the expedition had embarked, was driven by the tempest into the Bay of Pitsligo, in the north of Scotland, where it went entirely to pieces. The English captain attempted, in a very dark night, to convey himself and the ambassador ashore in a boat; but the skiff was overwhelmed by the waves, and the former drowned, while the latter with great difficulty succeeded in reaching the land. He thence proceeded to London, where Philip and Mary gave him a splendid reception.

From these events, an apprehension of disaster and feeling of dismay were associated with all such voyages along the northern boundary of Europe and Asia. This would not probably have damped the high spirit of enterprise by which the British were then animated; but the Muscovy Company, at the same period, had their attention diverted by the project of opening a communication with Persia and India across the Caspian, and by ascending the Oxus to Bokhara. This object

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they prosecuted at great expense, and by a series of bold adventures, in the course of which Jenkinson, Johnson, Alcocke, and others, penetrated deeply into the interior of Asia. An unusual degree of courage was indeed necessary to undertake this expedition, which was to be begun by passing round the North Cape to the White Sea; then, by a land journey and voyage down the Volga, across the whole breadth of the Russian empire to Astracan, before they could even embark on the Caspian. The truth is, such a scheme was marked by the ignorance not less than by the boldness of early mercantile enterprise. It was soon ascertained that no goods could bear the cost of so long a carriage by sea and land; that the products of India could be brought, and those of Europe returned, much cheaper and more commodiously, by the way of Aleppo and the Mediterranean, than by this vast circuit round the stormy North. If the former conveyance, therefore, could not stand a competition with the water-carriage by the Cape of Good Hope, how could the latter? It was abandoned, and no attempt for a long time was made to revive it.

This channel of intercourse with India having failed, the attention of commercial and nautical adventurers was again attracted to the possibility of effecting a passage by the north and east of Asia. Intelligence had just been received respecting the river Oby, which was reported to enter the ocean by seventy mouths, and therefore seemed likely to communicate with the most important countries in the interior. John Balak, who had taken up his residence at Duisburg, on the Osella, wrote to Gerard Mercator, the famous cosmographer, a particular account of this river, and of the efforts made by Assenius, a native of the Netherlands, to penetrate eastward along the Asiatic coast. He mentions in particular another river, described as a tributary of the Oby, but which, from the details, appears rather to have been the Yenisei, down which came "great vessels laden with rich and precious merchandise, brought by black or swart people." In ascending this river, men came to the large

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lake of Kittay (Baikal?), on whose banks were the Kara Kalmucks, who, he asserts, were the very people of Cathay. It was added, that on the shores of this lake had been heard sweet harmony of bells, and that stately and large buildings had been seen therein. Hence Mercator, in a letter to Hakluyt, infers that a very small progress beyond the limit already reached by navigators would carry them to the spacious realms of Japan and China. He maintained that the cape bounding the Gulf of Oby was no other than the great promontory of Tabis, which, according to Pliny, formed the north-eastern boundary of Asia; which being turned, the fortunate mariner would bear down direct upon Serica, Cathay, Cambalu,—those regions with which ancient and modern rumour had identified the position of the Chinese empire. This was underrating the breadth of Asia by a hundred degrees of longitude, or more than a fourth of the circumference of the globe; yet so imperfect were the sources of knowledge in those days, that the error, however immense, cannot be considered as fatal to the reputation of this great geographer.

To realize these views, Arthur Pet and Charles Jackman were supplied in 1580 with two vessels, the George and the William. On the 23d June they arrived at Wardhuys; from which they sailed on the 1st July. Approaching Nova Zembla they found themselves enclosed in a bay of ice, whence they were obliged to come out as they entered, and had much trouble before they were able to round the large field to which it belonged. On the 19th of the same month they saw Waygatz, and endeavoured to steer along its southern coast; but found the water so shallow that they were compelled to turn and make a circuit by the north. Proceeding onwards they came to a fair low island, and found a passage between the ice and the shore, which, however, at length closed, and they could advance no farther. At the same time the ships were separated by large fields of ice, and could communicate only by beating drums and firing muskets, till they were able to put about and rejoin

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each other. They enjoyed now the most favourable breeze; but all was rendered vain by the state of the ice. "Winds we have had at will, but ice and fogs too much against our wills, if it had pleased the Lord God otherwise." The captains therefore determined to return to Waygatz, where they might confer together, and endeavour to find a more open passage. They were now obliged to warp from one piece of ice to another, some of them so large that they could not see beyond them from the topmast. They were repeatedly enclosed by these masses, enveloped with dark fogs, and obliged to make fast to icebergs, where, "abiding the Lord's leisure, they continued with patience." On the 13th August they were involved among loose ice, a fragment of which broke the stock of their anchor, "and many other great blows we had against the same, that it was marvellous the ship was able to abide them." The boat, being between the floe and the brig, was struck, its side driven in, and the vessel itself was made to recoil backward. Pet and Jackman did not reach Waygatz till the 16th August; by which time, it being found impracticable to penetrate again to the eastward, they sought only to repass the North Cape. They appear to have been zealous, well-intentioned men; but, not duly acquainted with the phenomena of ice, they adhered too closely to the land, whence large masses are continually detached or carried down by the rivers, while the open sea might have afforded better hopes of a prosperous navigation.

The *United Provinces*, when roused to resistance by the ferocious bigotry of Philip and by the cruelties of the remorseless Alva, after a long, hard, and glorious struggle, succeeded in establishing their little territory as an independent republic. Thenceforth they began to look to the sea as the source of their greatness and prosperity. This element surrounded their country on all sides,—it towered, as it were, above them; and they had employed its inundations to defend their small domain against immensely superior forces. Commerce,—a commerce embracing the globe,—was necessary to compensate

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for the narrow limits within which they were hemmed, and to raise them to the first rank among European states. The East was the most promising quarter; but its approaches were strictly guarded, and they had not yet a fleet which could cope with the mighty armadas of Spain in the Atlantic and Indian Oceans. The North alone was open to their enterprise; and, by passing its frozen boundaries, they hoped to arrive at the rich and celebrated empires whence so ample a tide of wealth had flowed into Europe.

The first expedition was undertaken by a private society of merchants, upon asking permission only of the States and their high admiral, Prince Maurice. Three vessels, with a small yacht, were equipped at Amsterdam, Enchuysen, and Zealand. The pilot of the ship belonging to the capital, and to whose guidance the expedition was generally intrusted, was William Barentz, one of the most expert nautical men of the age.

The squadron sailed from the Texel on the 5th June 1594, and on the 23d arrived at the island of Kilduin in Muscovy. Approaching Nova Zembla it was formed into two divisions, one of which attempted to pass by the old route of the Strait of Waygatz; but Barentz himself, taking a bolder course, endeavoured to pass round to the northward of Nova Zembla, that great insular mass which opposed, like a barrier, his eastward progress. Here he coasted the Bay of Loms, so called from the numerous flocks of the bird of that name, probably the penguin, with wings so small, compared to its ample body, that it seemed astonishing how they could support the creature's motion in the air. Passing the Black Cape and William's Isle, his people saw various features characteristic of the Arctic world; among others the walrus in large herds, of which they give a very good description. Subsequently, at the Orange Isles, they came upon two or three hundred lying in heaps upon the sand, and basking in the sun. Having formed the erroneous idea that these animals are helpless on shore, the sailors marched against them as to an

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assured victory, congratulating themselves on the multitude of valuable teeth which would become an easy prize. But so completely were they mistaken, that these gallant amphibia beat them off with loss and dishonour, breaking in pieces the pikes, hatchets, and sabres, employed in this fruitless assault. The crews sustained also the fierce encounter of the Polar bear. Having seen one on the shore, they entered their shallop and discharged several balls at him, but without inflicting any deadly wound. They were then happy when they succeeded in throwing a noose about his neck, hoping to lead him like a lapdog, and carry him as a trophy into Holland. They were not a little alarmed by his mighty and tremendous struggles; but what was their consternation, when he fastened his paws on the stern and entered the boat! The whole crew hastily clung to the poop, expecting instant death, either from the sea or from his jaws. Providentially at this moment the noose got entangled with the iron work of the rudder, and the creature struggled in vain to extricate himself. Seeing him thus fixed, they at length summoned courage to advance, and despatched him with their spears.

Barentz, by the 1st August, reached the northern extremity of Nova Zembla, in lat. 77°; but the wind blew so strong, separating the ice into large flakes, that he and his crew, rather early it should seem, gave up hope and resolved to return.

The two other vessels meantime pushed on along the coast, and in due time arrived at Waygatz. This island had a very agreeable aspect, being covered with verdure and abundance of flowers, herbs, plants, and particularly a great store of leeks. Large trees were lying piled in heaps over each other, which appeared very surprising, when neither on this nor the opposite coast was there a single one growing; but it was rightly judged that they were brought down the rivers of Tartary, and drifted hither by winds and currents. On turning a point the Dutch observed one of those great collections

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of rudely carved images which had been formerly remarked by Burroughs. These figures represented men, women, and children, some of them having from four to eight heads, all with their faces turned eastward, and many horns of rein-deer lying at their feet: it was therefore called the Cape of Idols. Forster alleges that the Samoiedes, on this ground, have been falsely charged with idolatry, and that it were more charitable to conclude these to have been images of departed friends whom they cherished with pious veneration; but it does not very exactly appear how they should have had friends with six or eight faces.

The expedition had some difficulty in working their way through the Strait of Waygatz,—after passing which, and sailing for some space along the coast of Nova Zembla, they were repelled by the icy barriers. Having by perseverance rounded these, they arrived at a wide, blue, open sea, with the coast trending rapidly southward; and, though this was only the shore of the Gulf of Oby, they doubted not that it was the eastern boundary of Asia, and would afford an easy passage down upon China. Instead, however, of prosecuting this voyage, they determined to hasten back and communicate to their countrymen the joyful intelligence. The two divisions met on the coast of Russian Lapland, and arrived in the Texel on the 16th September.

The information conveyed in regard to the supposed success of this expedition kindled the most sanguine hopes in the government and people of Holland. Prince Maurice and the States-general no longer confined themselves to empty praise, but supplied funds to aid in a fresh voyage. Six vessels were fitted out, not as for adventure and discovery, but as it were to carry on an extensive traffic in the golden regions of the East. They were laden with merchandise, and well supplied with money; while a seventh, a light yacht, was instructed to follow them till they had passed the promontory of Tabis; when, having finally extricated themselves from the Polar ices, and directed their

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course to China, it was to return to Holland with the joyful tidings. Peter Plancius, the most celebrated cosmographer of that age, drew up a map for their guidance,—doubtless in our eyes a very crude performance, but which combined all the geographical lights of that ignorant period.

The armaments which at that early epoch were set forth with the greatest pomp and expense, usually issued in the most abortive results. Those large and heavily laden vessels were peculiarly ill-fitted for winding their way through narrow seas and channels encumbered with ice. Of all the northern expeditions, accordingly, none answered less than the one now described the cost and magnificent expectations with which it had been equipped.

The adventurers left the Texel on the 2d of June (1595), a period of the season decidedly too late. Nothing particular occurred till the 4th August, when they reached the pass between Waygatz and the continent, to which they had given the appellation of the Strait of Nassau. They soon afterwards came to the Cape of Idols; but, though the figures were still drawn up in full array, no trace was found of the habitations which they might have seemed to indicate. A Russian vessel, however, constructed of pieces of bark sewed together, was met on its way from the Pechora to the Oby in search of sea-horse teeth, whale-oil, and geese. The sailors accosted the Dutch in a very friendly manner, presented eight fat birds, and, on going on board one of the ships, were struck with astonishment at its magnitude, its equipments, and the high order with which every thing was arranged. This being a fast-day, they refused meat, butter, and cheese; but on being offered a raw herring, eagerly swallowed it entire, head and tail inclusive.

The navigators, after considerable search, discovered a party of Samoiedes, who are described as a people of small stature, broad and flat face, little eyes, short legs, and wrapt entirely in rein-deer skins, except a few who

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wore coloured cloth lined with fur. They manifested considerable jealousy of the strangers, and on the approach of the interpreter drew their arrows to shoot him; but he called aloud, "We are friends!" Upon which they laid down their weapons, and saluted him in the Russian style, by bending their heads to the ground. The intercourse which followed was conducted on their part with considerable courtesy, though mingled with a feeling of precaution and even of alarm. On hearing a gun fired, they leapt about like madmen, till assured that no harm was intended; and they were then amused by seeing a little stone placed on an eminence shattered to pieces by a musket-ball. A sailor went boldly up to the chief, dignified in the narrative with the title of king, and presented him with some biscuit, which the monarch graciously accepted and ate, though looking around somewhat suspiciously. At length the parties took a friendly leave; but a native ran after the foreigners with signs of great anger, on account of one of the rude statues which a seaman had carried off. It was now concluded that these figures were local divinities, and that the bones found lying before them were the remains of sacrifices. The Dutch seem to have formed a still lower estimate than Burroughs of Samoiede sculpture. The images are described as little better than logs, somewhat rounded at the top to represent a head, with a slight projection for the nose, two little holes for eyes, and one larger aperture to represent the mouth.

The discoverers, in answer to repeated inquiries, had been informed, that beyond a point which might be reached in about five days, there extended a large open sea to the south-east. They made several attempts to reach this point; but, after emerging from the passage of Waygatz, were always driven back by large bodies of floating ice. They persevered till the end of September, when these masses entered the strait in such force, that they were obliged with all speed to quit it by the western opening, and bend their sails towards Holland,

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without having accomplished any one of the brilliant objects for which they had been sent out.

A very considerable disappointment was experienced at the failure of an expedition concerning which such sanguine hopes had been cherished. The States-general declined to supply funds for a fresh armament; but they proclaimed a reward to any individual or body of men by whom the end in view should be successfully accomplished. The town-council of Amsterdam, with great spirit, determined to fit out another squadron on a smaller scale, and equipped only for discovery. They prepared two vessels, which were respectively intrusted, one to Barentz, and the other to John Corneliz Ryp, seemingly with equal power. Suspecting, perhaps, a prevalence of nostalgia, they admitted on board none but unmarried persons, who, it was hoped, would be animated with a more resolute spirit, and less inclined to long for home.

The vessels, still rather too late, set sail on the 10th of May 1596. Their object seems to have been to avoid the coast of Russia and the Straits, to shun even Nova Zembla, and to direct their course through the wide expanse of the Northern Ocean. They stood, however, too much towards the west, and on the 22d came in view of the Shetland Islands. Barentz urged that they should now turn due east in order to compensate this deviation; but Corneliz represented that this would carry them at once into the Strait of Waygatz, the scene of so many abortive efforts, and insisted upon steering towards the north-north-east. After changing their course, they saw the most brilliant celestial phenomenon they had ever witnessed. The sun was attended by two parhelia or mock suns, while a bright rainbow traversed all the three, and two other bows crossed the heavens in different quarters. On the 5th June some sailors called out that a multitude of white swans were swimming in the water; but the more experienced gave warning that these swans would prove pieces of ice, and accordingly they soon found themselves in the midst of

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these moving masses. For some days they proceeded between two currents of them as between two lands; while the colour of the water, which was as green as grass, gave them the idea of being near the country called Greenland: but Scoresby has shown, as is elsewhere noticed, that this tint is produced by the contents of the sea itself. On the 9th they observed a long island rising abruptly into steep and lofty cliffs, the highest of which has borne the appropriate name of Mount Misery. Pennant, who erroneously supposes that Bennet, in 1603, had the merit of originally making it known, remarks,—"The horror of this isle to the first discoverers must have been unspeakable; the prospect dreary; black where not hid with snow, and broken into a thousand precipices. No sounds but of the dashing of the waves, the crashing collision of floating ice, the discordant notes of myriads of sea-fowl, the yelping of Arctic foxes, the snorting of the walruses, or the roaring of the Polar bears." The hills were so excessively steep, that though a party contrived to clamber up they durst not look down, and the descent threatened the adventurers with no small danger. At length, applying their backs to the precipice, they slid down with safety; which Barentz, who looked up, could never have thought possible. From a bear, which they attacked, and vainly attempted to secure by a noose, they gave to it the name of Bear Island, which the English afterwards attempted to supplant by that of Alderman Cherie. Proceeding onward, still by too northerly a course, they reached the parallel of 80°, and discovered a coast, which soon proved to belong to a country of great extent. This was Spitzbergen, which, from the latitude they had attained, they probably approached near its northern point, called Hakluyt's Headland. The name of Greenland, which has in some degree adhered to this island, was given under the erroneous impression of its being a part of that extensive coast, so called by the Icelanders; to distinguish it from which, the epithet East has usually been applied to it.

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The Dutch, finding their progress stopped by this unexpected shore, now retraced their steps along its deep bays, still steering southward, till they found themselves again at Bear Island. Here Corneliz and Barentz differed once more; the former still maintaining his original views, and recommending that they should instantly push northwards, and endeavour to find their way along the eastern coast of the newly discovered land; but Barentz insisted, more rationally, that they ought to steer east-south-east, and endeavour to round the northern point of Nova Zembla. Being unable to agree, and the latter having resolved for this time not to yield, they determined to separate, and each to make trial of his respective course. Barentz, whom we follow, proceeded according to his plan, till at mid-day, on the 17th July, he found himself off the coast of Nova Zembla; but, as he had gone too far south, he was obliged to turn northwards once more. He pushed on as vigorously as possible; yet it was not till the 6th August that he doubled Cape Nassau; when, finding the ice drifting along in large masses, and being involved in deep fogs, he judged it expedient to moor his vessel to a large iceberg. As the master was walking on deck, he saw a large bear endeavouring to scale the sides of the ship. He immediately called out, "All hands up!" and the crew having mustered, raised loud cries, which induced the monster to retreat; but he soon returned to the charge. They had now a sail raised along the deck, and four guns loaded, which were fired with such effect that the savage animal finally withdrew.

On the 10th of August the ice began to separate, and the seamen remarked that the *berg* to which they were moored was fixed to the bottom, and that all the others struck against it. Afraid that these loose pieces would collect and enclose them, they quitted their position, and sailed on. The ice was already forming on the surface, and the ship in sailing through made it crack on all sides. Notwithstanding, they worked on their way, fastening themselves to successive fragments, one

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of which rose like a steeple, being twenty fathoms above and twelve below the water. At one time they saw round them more than four hundred large icebergs, the fear of which made them keep close to the shore, not aware of that being the quarter where these dangerous bodies were formed, and along which they chiefly ranged. However, they still proceeded, and having passed what they called Little Icy Cape came to Orange Island, which constitutes the northern extremity of Nova Zembla. Here ten men swam on shore, and having mounted certain piles of ice, which rose as it were into a little mountain, they had the satisfaction of seeing the coast trending southward, and a wide open sea to the south-east. They hastened back to Barentz with these joyful tidings, and the success of the voyage was now considered almost secure.

But these hopes were delusive; for, after doubling what was called Cape Desire (Zelania), the icebergs mustered in such force that the crews gave up all idea of doing more than reach the Strait of Waygatz on their return home. They were driven, however, so rapidly before the floating masses, that three men, who had mounted one of them to reconnoitre, would have been left behind, but for extraordinary exertions of agility. They were now drawn into what they called Icy Port, and the vessel was thrown into a position almost perpendicular, with one end nearly touching the bottom. From this critical attitude they were relieved next day; but fresh masses of ice continually poured in, augmenting the terrible ramparts with which they were enclosed. One side of her was raised by successive pieces jammed beneath it, but the other was similarly elevated; so that she was lifted to the top of the ice as by machinery. All this time the cracking, both around them and within the ship itself, was so dreadful that they were in continual fear of its parting into fragments; but the internal noise, arising merely from the freezing of the juices of the timber, was much less dangerous than they imagined.

They now felt that they must bid adieu for this year

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to all hopes of escape from their icy prison. As the vessel was cracking continually, and opening in different quarters, they made no doubt of its going to pieces, and could only hope to survive the winter by constructing a hut, which might shelter them from the approaching rigour of the season. Parties sent into the country reported that they had seen footsteps of rein-deer, also a river of fresh water, and, what was still more important, a great quantity of fine trees, with the roots attached to them, strewed upon the shore. Not one of these could have grown on the frozen soil of Nova Zembla; but, as already noticed, they were all brought down the rivers of Muscovy and Tartary, and wafted over the ocean by winds and currents. This circumstance gave a peculiarly cheerful colour to the hopes of the mariners. They trusted that Providence, which had in this surprising manner furnished materials to build a house, and fuel to warm it, would supply also whatever was necessary for their passing through the approaching winter, and for returning at length to their native country. A sledge was instantly formed, and three men cut wood, while ten drew it to the spot marked out for the hut. They were desirous to raise a rampart of earth for shelter and security, and with this view kindled a fire in the hope of softening the ground, but in vain.—The carpenter having died, it was found impossible to dig a grave for him, and they lodged his body in a cleft of the rock.

The building was carried on with ardour, as affording the only hope of life; yet the cold endured in this operation was intense, and almost insupportable. When a nail was put into the mouth, it froze to the lip, and brought the skin away, drawing blood. The snow sometimes fell so thick, for days successively, that the seamen could not stir from under cover. They had at the same time perpetual combats with the Polar bear. On one occasion the master saw from the ship three of these furious animals making their way towards the working-party, to whom he gave warning by uttering loud cries.

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They immediately ran towards the vessel; when one of them, in his haste, fell into a cleft in the ice, and was given up for lost; but the bears overlooking him, continued their chase of the main body. The sailors having at length reached the ship, made the circuit of it, and mounted from behind; but their pursuers entered in front, and advanced furiously to the attack. A man, sent down to the kitchen to light a match, was in too great haste and agitation to accomplish that simple process, and the muskets were thus useless. The crew could now only parry the assault by throwing at their assailants whatever came first to hand, by which the attention of the animals was always for a moment attracted, though they returned to the charge with fresh vigour. At length, when matters seemed approaching to extremity, a halberd was darted at the largest, which struck him on the mouth with such force that he retreated from the vessel, and the others followed.

Notwithstanding this intense rigour, winter had not yet thoroughly set in. Several days of south-west wind dissolved a vast quantity of ice, and the mariners saw a wide open sea without, while the vessel was enclosed within, as it were, by a solid wall. By October they completed their hut, and prepared to convey thither their provisions and stores. Some painful discoveries were now made. Several tuns of fine Dantzic beer, of an agreeable and medicinal quality, and from which they had anticipated much comfort, had frozen so hard as to break the casks, bursting even the iron hoops by which they were bound. The contents, indeed, existed in the form of ice; but this, when thawed, had merely the taste of bad water; and though in the middle they found a liquor concentrating in itself the whole strength of the beer, it had not the true flavour of that beverage. They made trial of mixing the two together, but without being able to restore its proper relish and virtue.

The sun, which had hitherto been their only pleasure and consolation, now began to pay only short visits, and to give signs of his approaching departure. He rose in

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the south-south-east, and set in the south-south-west, while the moon was scarcely dimmed by his presence. On the 1st November his full orb was still seen for a short interval; on the 2d it rested on the horizon, from which it did not detach itself; and on the 4th the sky was calm and clear, but no sun rose or set.

The dreary winter night of three months, which had now set in, was not, however, without some alleviations. The moon, which happened to be at the full, wheeled her pale circle round the whole horizon. With the sun disappeared also the bear, and in his room came the Arctic fox, a beautiful little creature, whose flesh resembled kid, and furnished a variety to their meals. They found great difficulty in the measurement of time, and on the 6th, as they did not rise till it was late, a controversy ensued whether it was really day or night. The cold had stopped all the clocks; but they afterwards formed a sand-glass of twelve hours, by which they contrived tolerably well to estimate the duration of their dreary solitude.

On the 3d December, as the sailors lay in bed, they heard from without a noise so tremendous, as if all the mountains of ice by which they were surrounded had fallen in pieces over each other. In fact, the first light which they afterwards obtained showed a considerable extent of open sea; yet this disruption must have been produced by some internal movement of the ice, and not by any tendency towards thaw.

As the season advanced the cold became more and more intense. Early in December a heavy fall of snow stopped up all the passages by which the smoke could escape; so that a fire, at all fitted for the dreadful inclemency of the season, led to the danger of suffocation. The men were thus obliged to keep the room at a miserably low temperature, for which they used the imperfect remedy of heated stones, passed from one bed to another. An unwonted difficulty accompanied every attempt to wash their clothes: whenever they took these up from the boiling water, and began to wring them,

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the linen froze in their hands; and when they hung them up to dry, the side farthest from the fire was hard frozen. The cold becoming always more rigorous, ice two inches thick was formed on the walls. At length their sufferings came to such an extremity, that, casting at each other languishing and sorrowful looks, they anticipated that this must end in the extinction of life. They now resolved that, cost what it might, they should for once be thoroughly warmed. They repaired, therefore, to the ship, whence they carried an ample supply of coal; and having kindled an immense fire, and carefully stopped up the windows and every aperture by which the cold could penetrate, they brought themselves into a most comfortable temperature. In this delicious state, to which they had so long been strangers, they went to rest, and talked gaily for some time before falling asleep. Suddenly, in the middle of the night, several wakened in a state of the most painful vertigo; their cries roused the rest, and all found themselves more or less in the same alarming predicament. On attempting to rise they became dizzy, and could neither stand nor walk. At length two or three contrived to stagger towards the door; but the first who opened it fell down insensible among the snow. De Veer, who stood behind, revived him by pouring vinegar on his face; and the wintry air, which had been their greatest dread, now restored life to the whole party.

These unhappy mariners being thus compelled to afford a certain access to the blast, its effects became more insupportable than before. It seemed as if the fire had lost all power of conveying heat; their clothes were white with snow and hoar-frost; their stockings were burned before the feet felt any warmth; and this result was made known by smell rather than by feeling. Yet, in the very midst of these sufferings, remembering that the 6th January was the Feast of the Kings, they besought the master that they might be allowed to celebrate the festival. They had saved a little wine and two pounds of flour, with which they fried pancakes in

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oil; the tickets were drawn, the gunner was crowned King of Nova Zembla, and the evening passed as merrily as if they had been at home round their own firesides. Nothing can more strikingly illustrate the salutary effects produced even in the most depressing circumstances by mental occupation and amusement,—an expedient of which Captain Parry afterwards made so happy a use.

About the middle of January the crews began to experience some abatement of that deep darkness in which they had been so long involved, and which prevented the exercise and amusement so necessary to their health. Soon after, about mid-day, a faint flush was seen to tinge the horizon; and this first dawn of the annual morning revived in their hearts the hope which was almost extinguished. On the 24th, De Veer and two others ran in to say that they had seen a portion of the sun's disc. Barentz demonstrated, on astronomical principles, that this could not take place for fifteen days to come. Many, however, trusted more to the eyes of their companions than to scientific deductions; and bets were taken, that could not be decided in the two following days, in consequence of a heavy fog with which the air was oppressed. The 27th, however, being clear, they went out in a body, and saw ascending above the horizon the full orb of that great luminary. Joy took possession of their hearts, and Barentz in vain continued to prove that this appearance was contrary to every principle of science. He was not aware of the extensive power of refraction in that northern atmosphere, which, in Captain Parry's expedition, produced a similar abridgment in the duration of the Polar winter.

Affairs now assumed a more cheerful aspect. Instead of constantly moping in the hut, the men went out daily, employed themselves in walking, running, and athletic games, which warmed their bodies and preserved their health. With the sun, however, appeared their old enemy the bear. One attacked them amid so thick a mist that they could not see to point their pieces, and

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sought shelter in the hut. The animal came to the door, and made the most desperate attempts to burst it open; but the master keeping his back firmly set against it, the unwelcome visiter withdrew. Soon afterwards, however, he mounted the roof, where, having in vain attempted to enter by the chimney, he made furious efforts to pull it down, tearing the sail in which it was wrapped; all the while his frightful roarings spread dismay through the mansion below: at length he finally retreated. Another came so close to the man on guard, who was looking another way, that on receiving the alarm from those within and looking about, he saw himself almost in the jaws of the bear; however, he had the presence of mind instantly to fire; when the brute, being struck in the head, attempted to escape, but was pursued and despatched.

The first reappearance of the sun had inspired hopes that the weather would become continually more mild and agreeable. It was, therefore, a severe disappointment, when, in February, a heavy gale from the north-east brought a cold more intense than ever, and again buried the hut under snow. This was the more painfully felt, as the men's strength, and supply of generous food to recruit it, were alike on the decline. They no longer attempted daily to clear a road, but those who were able went out and in by the chimney. A dreadful calamity then overtook them in the failure of their stock of wood for fuel. They began to gather all the fragments which had been thrown away, or lay scattered about; but these being soon exhausted, it behoved them to carry out their sledge in search of more. To dig the trees, however, out of the deep snow, and drag them to the hut, was a task which, in their present weak state, would have appeared impossible, had they not felt that they must do it or perish.

In the course of March and April the weather became milder, and the attention of all the crew was drawn to plans and prospects of return. Southward, on the side of Tartary, the icy masses were still floating, but to the

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north-east there was an open sea. Yet the barriers which enclosed the ship not only continued, but, to their inexpressible grief, rapidly increased, probably from the fragments which drifted into the harbour upon the breaking up of the great exterior field. In the middle of March these obstructions were only 75 paces broad; in the beginning of May they were 500. The piles of ice resembled the houses of a great city, interspersed with apparent towers, steeples, and chimneys. The sailors, viewing with despair the predicament in which they were placed, earnestly entreated permission to fit out the two boats, and in them to undertake the voyage homeward. The master at length agreed, provided there was no better prospect by the end of May. From the 20th to the 26th, a north wind came on, and blew upon them a still greater quantity of ice; so that they no longer hesitated to begin their work, and to bring from the ship sails and cordage. The extrication of the boats from under the snow was a most laborious task, and the equipment of them would have been next to impossible, but for the enthusiasm with which it was undertaken. By the 11th June they had the vessels fitted out, their clothes packed, and the provisions embarked. Then, however, they had to cut a way through the steeps and walls of ice which intervened between them and the open sea; while amid the extreme fatigue of digging, breaking, and cutting, they were kept in play by a huge bear, which had come over the frozen sea from Tartary.

At length, having embarked all their clothes and provisions, they set sail on the 14th with a westerly breeze. In the three following days, having passed the Cape of Isles and Cape Desire, they came to Orange Isle, always working their way through much encumbering ice. When they were off Icy Cape, Barentz, long struggling with severe illness, and now feeling his end approach, desired that he might be lifted up to take a last view of that fatal promontory, on which he gazed for a considerable time.

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On the following day the vessels were again involved in masses of drift-ice, and were so forcibly struck, as well as squeezed between opposite fields, that the men bade a final adieu to each other. Seeing, however, a body of fixed ice at a little distance, De Veer took a rope and leaped from fragment to fragment, till he arrived on the firm surface. A communication thus formed, they landed first the sick, then the stores and provisions, and, finally, they drew up the boats themselves. During this detention, Barentz, being informed of the severe illness of one of the men named Adrianson, said that he himself was not far from his end. As he continued, however, conversing and looking on a chart of the voyage made by De Veer, it was thought that his disease could not be so serious, till he pushed aside the paper, asked for a draught of water, and immediately expired. This event deeply afflicted the crews, both from their personal attachment to him, and the loss of his skill in piloting the vessels.

The sailors with some drift-wood, repaired the boats; yet the ice was still close around, and they were struck with the fear that it was not possible for them to escape from this bank. On the 22d, however, open sea appeared at a little distance; and having dragged the boats over successive pieces of ice, they were again afloat. After three days they reached Cape Nassau, the ice frequently stopping them, but separating again like the gates of a sluice, and allowing a passage; though on the 26th they were obliged once more to disembark and pitch their tents on the frozen surface. On the opposite coast they saw immense herds of the walrus, and the air was darkened with numberless birds. While they were fast asleep in the tent, the sentinel called out, "Three bears! three bears!" The whole crew were instantly out; but their muskets were charged only with small shot. However, "these sweetmeats," though they could not inflict any serious wound, induced the monsters to turn, when one of them was pursued and killed. The survivors carried off their dead companion

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to the most rugged parts of the ice, where they devoured a large portion of his carcass.

The year was now advanced; the bright light of the sun and the occasional south-westerly breezes dissolved the ice, and gradually opened a way before them. But dangers of a new class soon succeeded. The distinction between fixed and floating ice had now almost ceased, the former continually melting away. When they thought themselves lying secure on a large field, a body of icebergs came in from the sea, struck and dashed it to pieces. The packages were separated from the boats, and several dropped into the water. With much labour and peril they scrambled over the detached fragments to a place of safety, while the weighty articles sank into the softened ice, not without the greatest risk of falling to the bottom. For twelve hours the sailors floundered through this loose and broken surface before they could establish themselves on the field which was attached to the land.

The 2d of July was the finest day yet seen in Nova Zembla; and the weather continuing favourable, produced on the 7th an open sea, to which, with great labour, the men succeeded in dragging the boats. From this time their progress, though often obstructed, was never entirely stopped. In several of the rocky bays they caught an immense number of birds, which, not having yet learned to fear man, allowed themselves to be taken by the hand. Near Admiralty Bay they saw two hundred walruses lying on a bank of ice, and attacked them; but these powerful animals advanced to the combat, snorting and blowing in so tremendous a manner that, had not a fresh wind sprung up, the mariners might have had to bewail a serious loss; and they regretted, amid so many inevitable evils, to have brought on themselves one so very unnecessary.

On the 28th, after passing the bay of St Lawrence, when they came near the southern extremity of Nova Zembla, they discovered with surprise and joy two Russian vessels at anchor. They approached and were

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well received by the crews, several of whom recollected having met them in the former voyage, and were truly astonished, instead of the large and handsome vessels whose equipment they had so much admired, to see them in miserable open boats, with pale and meagre countenances. After mutual presents, the parties agreed to sail together to Waygatz, but were separated by a heavy gale. On a small isle the Dutch found abundance of *cochlearia*, or scurvy-grass, by the use of which the sick recovered in a manner almost miraculous. On the 3d August they steered their course to the south-south-west, and though somewhat obstructed by ice, came next day in view of the Russian coast. They had a tedious but safe voyage to Kola, where, to their joyful surprise, they found John Corneliz, who displayed the greatest kindness, and afforded them a comfortable passage to Amsterdam. As no account was ever given of this commander's own proceedings, it may be presumed that they did not lead to any important discovery.

The question as to a north-eastern passage was not yet considered as finally determined. The London merchants next took it up, and in 1608 sent out Henry Hudson, who had already distinguished himself by a voyage to Spitzbergen, and proved one of the greatest of the early navigators. The design of this able seaman appears to have been, not to entangle himself in the straits and islands on the Russian coast, but to strike at once into the channel between Nova Zembla and Spitzbergen. He dropped down to Blackwall on the 22d April, and on the 3d June saw the North Cape, bearing south-west. He still pushed on to the north and east, till he reached the latitude of 75°, when he found himself entangled among ice. He at first endeavoured to push through, but, failing in this attempt, turned and extricated himself with only "a few rubs." On the 12th June he experienced a thick fog, and had his shrouds frozen; but the sky then cleared, and afforded bright sunshine for the whole day and night. On the 15th, Thomas Hilles and Robert Rayner so-

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lemnly averred, that, while standing on deck, they saw a mermaid. This inhabitant of the deep is described as having a back and breast like a woman, a very white skin, and long black hair flowing behind; but on her turning round they descried a tail as of a porpoise, and speckled like a mackerel. It seems uncertain which of the cetaceous tribe suggested this resemblance to the human form.

Hudson continued to push on eastward, varying according to the wind, between the latitudes of 74° and 75°. On the 25th, however, heavy north and north-easterly gales, accompanied with fog and snow, obliged him to steer south-easterly; and this course, on the 26th, brought him to the coast of Nova Zembla, in lat. 72° 25′. Here, with premature resignation, as June was not yet closed, he concluded that it were fruitless to hold this year a more northerly course; in place of which he resolved to try the old route of the Waygatz. From this he was diverted by the view of a large sound, which appeared to afford an equally promising opening. On its shores also were numerous herds of the sea-horse, from the capture of which he hoped to defray the expense of the voyage. Nova Zembla, on the whole, seen at midsummer, presented to him somewhat of a gay aspect. He says, it is "to man's eye a pleasant land; much mayne land, with no snow on it, looking in some places green, and deer feeding thereon." The sound, however, as might have been conjectured from the strong current which flowed down, terminated in a large river, and the boats soon came to anchorage in one fathom. The morses also, though seen in great numbers, could never be brought to close quarters. The ice now came in great masses from the south, "very fearful to look on;" and though, "by the mercy of God and his mighty help," he escaped the danger, yet by the 6th of July he was "void of hope of a north-east passage;" and, determining to put his employers to no farther expense, hastened home to England.

We know not whether the Muscovy merchants were

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fully satisfied with the zeal displayed by Hudson in this expedition; for we find him in 1609 setting sail from the Texel under the auspices of the Dutch East India Company, whose hopes of a northern passage had again revived. On the 5th May he passed the North Cape, and on the 19th came in view of Wardhuys. It may be remarked, however, that our countryman, though so excellent a navigator, is a most unsatisfactory writer. His narrative, amid vague complaints of fog and ice, shows nothing distinctly but that he determined to repass the North Cape, whence he steered across the Atlantic to America. Forster says that he reached Nova Zembla,—an assertion directly contrary to the captain's own narrative, and inconsistent with the time spent in this part of the voyage. According to Constantin, the crew, consisting chiefly of seamen accustomed to sail to India by the Cape of Good Hope, were soon alarmed by the tempests and floating ice of the North. The truth is, the commander's own mind seems to have been fixed on north-western discovery. This appears from several hints in his second narrative; and he was probably inclined to content himself with a mere show of proceeding eastward, that, apparently baffled, he might follow his favourite direction. He seems to have been impressed with the expectation of finding an open sea between Virginia and Newfoundland; and in fact he discovered the important bay which receives the river, called after him the Hudson, and on which New York was afterwards built; but this lies out of our present sphere.

The Russia Company, at a subsequent period, made some attempts to establish a factory on the Pechora; but after persevering for two or three seasons, they relinquished the undertaking.

In 1676, Captain John Wood, on his own sanguine representations as to the great probability of a north-eastern passage, was sent out by the Admiralty in the Speedwell. On the farther coast of Nova Zembla, however, his vessel went to pieces, and the crew, cast on

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shore, with difficulty reached their consort, the Prosperous Pink, which afforded them a passage home. Wood, though he had done nothing to throw light on the subject, brought back an impression respecting it so very gloomy, that the plan of penetrating to India in this direction was thenceforward given up, and has not been revived even in the eras of the most enthusiastic enterprise.

It may be proper in this place to notice the attempts recently made by the Russian government to complete the survey and exploration of Nova Zembla, to our knowledge of which little addition had been made since the time of Barentz. To effect this object an expedition was despatched in 1819 under Lieutenant Lazaref; but it encountered such formidable masses of ice, that he was obliged to return without in any degree effecting his object. Captain Litke was employed in the same undertaking in 1821, but the issue was almost equally unfavourable. In the following year, however, the same officer was again sent to sea; and, after an extensive survey of the coast of Lapland, came, on the 8th August, in view of Nova Zembla. During his progress along the western shore, he found it in general to correspond with the delineation given by Barentz, recognising in particular Admiralty Isle; after which he reached a headland supposed to be the Cape Desire of that navigator, but differing by about 15 degrees from the longitude which he had assigned to it.

Litke was intrusted with a similar command a third time in 1823, when he ascertained that the promontory which he had imagined to be Barentz's Cape Desire, was in fact his Cape Nassau, and that the description of it given by this celebrated discoverer was quite correct. In the same voyage he had an opportunity of examining the great strait, called Matotchkin Schar, which divides the island into two parts, and found its length to be about 52 English miles.

His general conclusions are, that the southern section of the coast is low and flat; but that about lat. 73° there

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commences a chain of somewhat lofty mountains, the summits of which are covered with snow. The appearance of the country is dreary and miserable in the extreme; notwithstanding which, the idea entertained by those who consider it as a mere mass of ice, partially sprinked with soil, was found quite erroneous. Captain Litke brought home with him specimens of the different rocks and earths of which it is composed.

The same navigator was appointed once more in 1824, with instructions to examine the eastern coast; but in endeavouring to penetrate between Spitzbergen and Nova Zembla he was completely repulsed by the masses of ice with which the sea was encumbered; while his attempt to make a passage by the Strait of Waygatz was equally defeated by contrary winds and calms. Hence, notwithstanding these spirited efforts on the part of the Russian government, no great accession has been made to our knowledge of that insular territory.

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CHAPTER V.

Early Voyages towards the North Pole.

Plan of a Polar Passage to India—Voyages to Cherie Island—Hudson—Poole—Baffin—Fotherby.

THE attention of the public, it has appeared, was early drawn towards a Polar passage, which, by striking directly across the Arctic ocean, might bring the navigator by a shorter route than any other to the golden realms of the East. Mr Robert Thorne, a zealous promoter of discovery, in his memorials to Henry VIII. and other great men, always placed foremost the scheme of reaching India by this improved course. It is not wonderful, however, that such a voyage should not have been among the first which were attempted. A century had elapsed from the discovery of the passage by the Cape of Good Hope, and half that period since the commencement of the naval career of Britain, before her seamen, despairing of success by the more circuitous tracks hitherto followed, put forth all their strength to cross the icy waters which surround the northern pole of the earth.

Barentz, as already noticed, had in his third voyage discovered Spitzbergen; but it was in pursuit of the fishery that the English were first attracted into the high latitudes of the Greenland or Polar Sea. In 1603, Alderman Sir Francis Cherie of London fitted out the Godspeed, under the command of Stephen Bennet, apparently with the vague idea of exploring the Arctic shores, and ascertaining their sources of commercial wealth. The captain at first followed the beaten track

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of the North Cape, Wardhuys, and Kola; after which, reversing his direction, he pushed north and north-west into the ocean. On the 16th August, at two o'clock, he descried two hills which seemed to rise above the clouds. In four hours he reached the Bear Island of Barentz; and not having heard, it should seem, of its previous discovery by that navigator, gave to it, in honour of his own employer, the name of Cherie. Here the sailors caught only two foxes and a few fishes; for though they saw the teeth of a morse, proving that those animals did "use there," the season was considered too far advanced to commence operations against them. He directed his course homeward by Kola and the North Cape, and reached the Thames on the 15th October.

Sir Francis, on the return of the ship, though it came empty, was so far satisfied as to send it out next year under the same commander. Bennet, accordingly, not only went out a second time, but made several successive voyages, in which the capture of the morse was carried on with considerable success.

While these things were going on, Henry Hudson, in 1607, was despatched by the Muscovy Company to penetrate, if possible, directly across the Pole. This bold enterprise had not been before attempted, and it constitutes the first recorded voyage of the eminent navigator to whose skill it was confided. Having sailed on the 1st May, he passed the latitude of Iceland, and took a direction westward, being desirous to survey the northern boundaries of Greenland, thinking there might be an open sea in that direction as likely as in any other. On the 13th June the ships were involved in thick fog, their shrouds and sails being frozen; but, when it cleared next morning, the sailors descried a high and bold headland mostly covered with snow, behind which rose a castellated mountain, named the Mount of God's Mercy. Rain now fell, and the air felt temperate and agreeable. They steered eastward to clear this coast; but, after being for some time enveloped in mists, again saw land, very high and bold, and without snow even on the loftiest

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mountains. To this cape, situated in 73°, they gave the name of Hold-with-Hope.

He now took a north-eastward direction, and on the 27th faintly perceived the coast of Spitzbergen. He still pushed northward, till he passed the 79th degree of latitude, where, though the sun at this season did not descend lower than ten degrees above the horizon, the weather was piercingly cold, and the shrouds and sails often frozen. The ice obliged him to steer in various directions; but, embracing every opportunity, he pushed on, as appeared to him, to 81½°, and saw land stretching without interruption as far as 82°. But as the extremity of Spitzbergen does not lie beyond 81°, he must have committed some mistake, either in his latitudes or in mistaking for land extensive fields of ice. It has been supposed that he had again reached the opposite coast of Greenland; but this seems inconsistent with his bearings, which are always more or less to the eastward. The sea, in the latitudes of 81° and 82°, he considers to be so completely barred with ice as certainly to defeat all attempts at a passage to the Pole in this direction; though, in his opinion, it might be frequented with great advantage on account of the immense multitude of seals with which it abounds. He returned, coasting along Spitzbergen, some parts of which appeared very agreeable; and on the 15th September arrived in the Thames.

The Muscovy Company, still the most enterprising body in England, determined to fit out another expedition for Polar discovery. They intrusted it to Jonas Poole, who had distinguished himself in the Cherie Island voyages; and it was hinted to him, that though discovery was to be his main object, yet he might catch at intervals some morses, and even one or two whales, to make the voyage defray its own expenses. He took his departure in due season, sailing from Blackwall on the 1st March 1610. By the 16th he had reached the coast of Norway, in lat. 65°, but the wind then blew from the north so "extreme fierce, with great store of snow and frost," and the vessel was so laden with ice,

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that it could not maintain a "fore course," and was driven back as far as Scotland. Here he remained till the 12th April, when, favoured by a southerly breeze, he again set sail, and after many storms, snows, and extreme frosts, came in view, on the 2d May, of the North Cape. He then steered for Cherie Island, near which he judged himself to be on the 6th; but the fog was such that he could not see a cable's length, and "the ship had many a knock; but, thanks be to God, no harm was done!" Continuing to beat about in this obscurity, he entirely missed his object, and the first land seen by him was in 76° 50′, being the shores of an inlet on the coast of Spitzbergen, which, from the deer's horns found there, he named Horn Sound. He pushed on to 77° 25′, where he found the air more temperate than he had formerly felt it at the North Cape at the same season. Soon, however, there was a complete reverse; the ship was involved in thick fogs,—and wind, frost, snow, and cold, seemed to strive for the mastery. After many a sore stroke he got the vessel through; but the mainsail was still "frozen as hard as ever he found any cloth," and could with great difficulty be set. He discovered an island, which he called Blackpoint, and the nearest promontory he named Cape Cold; but next day the weather changed so entirely that he gave to a similar projection the milder appellation of Fair Foreland. His views continued to brighten, when he found that the sun, as the season advanced, gave a most powerful heat; that the ice was melted on the ponds and lakes; while that which still floated on the sea was not nearly so huge as he had seen it in 73 degrees. He conceived favourable hopes, therefore, even after so sharp a beginning, and judged that a passage by the Pole was as likely to be found in this as in any other meridian. He might therefore have been expected to apply himself in the most zealous and determined manner to make the discovery. A large herd of morses, however, having come in sight, he despatched his crew in pursuit of them; and from this time there is not another word of prose-

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cuting the research. The taking of the walrus and the deer, and now and then an attack on the whale, absorbed his whole attention. He met with some dangers. One day he attacked a herd of morses lying on ice, which proved hollow, and suddenly broke, whereon ice and beasts slid into the sea together, and the crew had great difficulty in not going along with them, especially one man; for, besides being crushed by the weight of the carcasses, the animals that were alive struck at him in the water, and severely bruised him. Upon the whole he judged Spitzbergen to be milder than Cherie Island, and was not less surprised at the great number of deer, than at the care of Providence, which enabled them to subsist on so little pasturage, with only the rocks for a house, the starry canopy for a covering, and not a bush or a tree to shelter them from the nipping cold of winter.

Although Poole returned from this voyage without having done or almost attempted any thing, yet, as he brought a considerable store of oil and teeth, his employers were not ill satisfied. They fitted him out next year in the Elizabeth of fifty tons, and in their instructions distinctly informed him that discovery was to be his main object; yet intimated, as before, that as he proceeded with the Mary Margaret, destined for the whale-fishery, he might begin by joining her in taking a few whales, and in his course along the coast kill as many morses as might chance to present themselves. Having extracted the oil, he was to floor the hold with their skins, which a tanner had agreed to purchase of the Company; but all this was only to lighten the cost of discovery, and not to be in any degree a primary pursuit.

The vessels set sail early in April 1611, but were soon separated by fogs and storms; and when Poole reached the coast of Spitzbergen, he found only three boats escaped from the wreck of the Mary Margaret. In the rest of his proceedings we never hear a single word of discovery; but applying himself most diligently

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to the secondary object, by the 3d of August he had accumulated oil, morse-skins, and teeth, to the extent of 29 tons,—a good lading, he observes, for a ship of 50. Accordingly it proved her ruin. As the last package was brought in, she went entirely to one side, and all the skins, which lay loose in the hold, slipping in the same direction, carried her altogether under water. Poole, who sat in the cabin, considered himself as having only the choice of being drowned by remaining, or, in attempting to escape, of being killed by the casks, staves, and divers other things which were traversing the ship in every direction. He chose the latter alternative as the least certain, and, though twice beaten down, was plucked from the jaws of death, being enabled to crawl out with his skull laid open, and his ears, back, and ribs severely bruised. The crew, who all escaped, were taken on board a Hull ship commanded by Thomas Marmaduke, of whom Poole makes many complaints; which Purchas, thinking too diffuse, has omitted. As to Greenland, he observes, in general, that when he first went, the mountains and plains were almost entirely white with snow; afterwards they appeared green with grass and a little moss; but, lastly, the sun with his powerful heat dissolved the ice, and exhaled such a profusion of vapours, that the day differed little from the darkest night elsewhere.

He was, nevertheless, sent out a third voyage in 1612, with two vessels, the Whale and the Sea-horse; but he seems on this occasion also to have busied himself solely in the capture of whales, which he killed to the amount of thirteen. No mention is made of anything being either attempted or projected in relation to discovery; though he states that Marmaduke penetrated to the latitude of 82°. No detail, however, is given, nor have we any narrative from that captain himself; which is to be regretted, as he seems to have been more deeply imbued with the spirit of research than any other mariner of that time.

The next expedition took place in 1613, under

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William Baffin, the most learned navigator of the age, and one of the greatest names in northern adventure. It was not, however, by this voyage that he obtained his reputation, though he was provided with six good and well-armed ships; the object of it appearing to have been little else than to chase from the Greenland seas all other vessels that might attempt to use them for fishery. Their practice was, whenever they fell in with a foreigner, to summon the master on board, show the king's commission granted to the worshipful Company, and desire him to depart, on pain of having a cannonade immediately opened upon him. The strength of the English being in general decidedly superior to that of any other squadron in those seas, these terms were usually acceded to without opposition. At one time, indeed, five vessels, Dutch and French, including a large one of 700 tons from Biscay, mustered, and showed signs of offering battle; but the Spaniard having lost courage and yielded, the rest were obliged to follow his example. On another occasion a Dutchman having refused, and endeavoured to make off, so brisk a fire was opened upon him, that he had nearly run on shore, and was fain to submit. A considerable number of English sailors seem to have been on board these foreign ships, who were all forcibly taken out. It seems difficult to discover on what ground the subjects of King James attempted to establish their right to these coasts, since they had neither been the first discoverers, nor held them in any sort of occupation. In fact, they were not able ultimately to make good the pretensions which they urged in so violent a manner.

There is no mention of any effort on the part of Baffin for the purpose of discovery. On the contrary, Marmaduke, who had again endeavoured to penetrate to the north of Spitzbergen, was chidden for having thereby hindered the voyage, and was prohibited from any farther attempts of the kind during the season. The former, however, made some curious observations on the effects of refraction in high northern latitudes.

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The Company still did not consider the question of a northern passage decided, as, indeed, since the time of Hudson, it could not be said to have been seriously attempted. In 1614 they appointed Robert Fotherby, in the Thomasine, to accompany their Greenland fleet of ten ships and two pinnaces, with instructions, while the rest were fishing, to devote himself mainly to discovery. Baffin accompanied him as pilot. After considerable obstructions, eleven vessels being at one time fast among the ice, the captain, by the 6th of June, pushed on to Hakluyt's Headland. He endeavoured to penetrate through Magdalena Bay, which he calls Maudlen Sound; but the weather was foul, and the ice lay unbroken from shore to shore. On the 10th he stood farther out, and succeeded in passing to the north of the headland, when he again encountered an impenetrable barrier. He then steered westward, in hopes of discovering a more favourable opening; but the ice trending south-west, he sailed twenty-eight leagues without success, and then returned to the Foreland. About the middle of July, the air becoming clear and favourable, he and Baffin ascended a high hill, to see what prospect there was of getting forward; but as far as they could discern, ice lay upon the sea, which indeed seemed wholly "bound with ice," though in the extreme distance there was an appearance of open water, that inspired some hope. After amusing themselves for some days killing whales, they again mounted a very lofty eminence, from which they saw an extensive channel, but much impeded with ice. This was Sir Thomas Smith's Sound, which they afterwards ascended to its head, and found a good harbour, very advantageously situated for the whale-fishery.

It was now the 9th of August, and Fotherby saw two Dutch ships, which had been sent out for northern discovery, making their way homeward, after relinquishing the undertaking in despair; but he was determined not to be baffled in his attempt without some farther struggle. He pushed towards the north from Cape

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Barren, and had made twenty-four leagues, when he again met the ice. He coasted along it two days, hoping to find an opening among its shattered fragments; but a north wind sprang up, with heavy snow, and every thing being cold, thick, and winter-like, he was forced once more into harbour. The shore and hill being now covered with snow, the crew were seized with the desire of returning to England; but the captain was still unwilling to depart without some farther satisfaction. He went in a boat up Redcliffe Sound, and though ice was newly formed upon it, of about the thickness of a half-crown piece, he pierced through, and got into open water. The snow, however, continued to fall thick, and the east wind blew in the ice so forcibly, that he was glad to return to the ship. Passing a point, it was observed that a cross which our countrymen had erected, with the king's arms and a sixpence nailed upon it, had been taken down, "sixpence and all," by the Dutch, and Prince Maurice's arms substituted; this grievance, however, was speedily redressed.

About the end of August a gale sprang up from the south-west, and brought milder weather than at any former period of the season; and the strength of the thaw was proved by huge masses falling from the snowy banks into the sea with a sound like that of thunder. Conceiving better hopes, the navigator pushed out again, in a north-west direction, till he came nearly to the latitude of 80°, when he heard a mighty noise of the waves, as it were, breaking on an extensive shore. It proved, however, that he was now on the margin of the great northern ice. He coasted for some time along that grand barrier; but was soon embayed, whence it was not without difficulty that he extricated himself. The season advancing, he took the benefit of a fair wind to steer homewards, and on the 4th October arrived at Wapping, with his whole crew of twenty-six men in perfect health.

Fotherby, having recommended himself on this voyage by spirit and diligence, was sent out next year

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(1615) by the worshipful Company, in the Richard, a pinnace of only twenty tons. After many conflicts with ice and fog, he reached Hakluyt's Headland about the beginning of July. He forthwith began his career of discovery; but a strong southerly gale driving him upon the ice, shattered his bark considerably, and obliged him to return. As soon as his vessel was refitted, he endeavoured, by a westerly course, to find an opening among the ice, which projected in various points and capes, but remained still fixed, and he found himself pushed by it southwards to the latitude of 76°. However, he sailed still farther west, towards what he thought should have been the southern part of Hudson's Greenland; and seafowls in vast flocks seemed to indicate land, but the fog lay so thick, "that he might easier hear land than see it." When about lat. 71½°, the air cleared, and he descried a snowy hill very high amid the clouds, while the fog lying on each side made it appear like a great continent. It proved, however, to be only an island, probably Jan Mayen; and as the shores presented nothing but drift-wood, and appeared as if fortified with castles and bulwarks of rock, no shelter was afforded from a heavy gale which began to blow. This induced him to stand out to sea, when he regained the northern point of Spitzbergen, and began to beat for a Polar passage. The wind, however, blew so strong from the north-north-east, that he gave up the attempt, only resolving, on his way home, to take a survey of Hudson's Hold-with-Hope. He came to the place where it ought to have been, but finding no land, he insisted that his predecessor must have been mistaken in the position assigned to it,—a suspicion which has been recently confirmed by Mr Scoresby. Availing himself then of a brisk northerly breeze, he shaped his course for England.

Fotherby, on being asked his opinion as to the probability of a passage through the Arctic Ocean, replied, that though he had not attained in this respect his desire, nothing yet appeared to exclude hope. There was,

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he remarked, a spacious sea between Greenland and Spitzbergen, though much pestered with ice; and therefore he would not dissuade the worshipful Company from a yearly adventure of £150, or £200 at the most. The little pinnace, with ten men, in which he had sailed two thousand leagues, appeared to him more convenient for that purpose than vessels of larger dimensions. A very long period, however, elapsed before any attempt of this nature was resumed.

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CHAPTER VI.

Early Voyages in Search of a North-west Passage.

The Portuguese; The Cortereales—The Spaniards; Gomez—Expeditions under Henry VIII.; their Issue—Frobisher's First, Second, and Third Voyages—Davis' First, Second, and Third Voyages—Weymouth—Knight—Hudson; Mutiny of his Men; Disastrous Issue of the Expedition—Voyages of Button—Gibbons—Bylot—Baffin—Jens Munk, the Dane—Fox and James—Knight and Barlow—Middleton, &c.

NOTWITHSTANDING the repeated efforts to find a passage by the east and north-east, the west finally became the scene of the grandest naval enterprises, and flattered the nation longest with the hope of this signal discovery. The maritime world were not yet aware of the immense breadth of America at its northern limit. That continent was imagined to terminate in a cape, after rounding which, and passing through the Strait of Anian,—an imaginary channel, supposed by the early geographers to separate America from Asia,—an entrance would be opened at once into the Pacific, in which the navigator might proceed full sail to Japan, China, the Spice Islands, and all the other regions abounding in Oriental wealth.

Of the European nations, Portugal was the first to embark in the career of ocean-discovery. Her monarchs and nobles employed their utmost exertions to double the southern point of Africa, and thereby to overcome the obstacles opposed by that continent to a direct commerce with India. Their efforts were crowned with

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success; and the passage by the Cape would have been the most brilliant exploit ever performed, had it not been rivalled by the contemporaneous discovery of America. Enough might seem to have been done, both for the benefit and the glory of the nation, without directing their efforts into any other channel; yet one of the most illustrious houses of that kingdom, with much enthusiasm and no small loss, devoted itself to western navigation. We allude to that of Cortereal; for a member of which, named John Vaz, claims, though somewhat doubtful, have been advanced for the honour of having reached the shores of Newfoundland some time before the celebrated voyages of Columbus or Cabot. In 1500, his son Gaspar, immediately upon hearing of the successful labours of the former of these commanders, resolved to follow his steps. Having obtained from the king two vessels, he touched at Terceira, one of the Azores, and proceeded in a north-west direction, endeavouring to find his way to India by some of the higher latitudes. Respecting the details of this voyage there remain only detached notices, which Mr Barrow has collected with his usual learning and diligence. He reached the coast of America about the parallel of 50°, probably on the northern shore of Newfoundland, where he found a bay containing numerous islands which he calls the Golfo Quadrado,—conjectured to be the Straits of Belleisle. He then steered northwards, and passed along a coast which Europeans have since commonly called Labrador, but which in the early maps bears from him the name of *Corterealis*. In some of the narratives it is designated *Terra Verde* (Greenland), but it has nothing in common with the country to which Europeans have still more improperly affixed that appellation. The territory is represented as amply stocked with timber,—a description which applies to the spacious forests of fir and pine that clothe the region contiguous to Canada on the north. The natives are correctly described as a mild and laborious race;—and no less than fifty-seven being allured or carried on

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board, were conveyed to Portugal. After a run along this shore, estimated at about 700 miles, Cortereal came to a point which seemed to preclude all farther progress. Ramusio, indeed, states that the highest latitude he attained was only 60°, which would coincide nearly with the entrances into Hudson's Bay. But the season was now somewhat advanced; and the approach of the Polar winter, the floating mountains of ice, the thick snows which filled the air,—the gloomy characteristics of an Arctic climate,—must, to a crew accustomed to warm and temperate seas, have appeared peculiarly terrible. It was therefore judged absolutely necessary to return home, and Cortereal arrived at Lisbon on the 8th October 1501.* That this necessity, however, was con-

* The view here taken of Cortereal's voyage, as extending along the coast of Labrador, has been lately contested, and even treated as an "absurd hypothesis," by the anonymous author of "A Memoir of Sebastian Cabot." He maintains that the most northern point reached by that navigator was in the Gulf of St Lawrence, or at farthest the southern extremity of Labrador. This question, relating to one of the most illustrious martyrs in the cause of early discovery, seems to merit some attention. It may be premised, that this hypothesis can with no propriety be called *ours*, since it is the general belief of modern geographers, expressed by the very names of *Cortereals* and *Labrador*, always applied to this coast. Doubtless it was perfectly open for the author, if he could, to disprove this opinion and establish his own; but it is conceived that a very few observations, founded in a great measure on documents produced by himself, will prove it to be palpably erroneous.

First, The voyage is allowed on all hands to have been directed towards the north, and with a view to northern discovery. But as the objects lay westward, the direction would of course be modified accordingly, and we may accept the statement of the Italian ambassador, that it was *tra maestro e ponente* (between north-west and west). But such a course, either from Lisbon or Terceira, could scarcely be compatible with his reaching any point south of the St Lawrence, certainly not one which would admit of 600 or 700 miles of northerly navigation before reaching that river. By supposing one degree of northern for every four of western sailing, we should make him reach America in about the latitude of 50 degrees, which would place him on the northern coast of Newfoundland.

Second, The mild and laborious character ascribed to the natives (*molto mansueti—excellentia da fatiga*), presents the most striking contrast to the fierce and proud indolence of the

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sidered to arise from the season only, and that no panic was struck into the mind of this intrepid navigator, was

North American Indians; it applies exclusively to the Esquimaux tribes. The habit of subsisting almost wholly on fish, the clothing formed almost entirely of seal-skin, the roofing of the huts with skins of fishes, are features which, occurring to such an extent, become strikingly characteristic of shores inhabited by Esquimaux.

These two first observations concur to render our conclusion highly probable; the *third* seems to remove every shadow of doubt. After sailing along this coast six or seven hundred miles, the navigator was arrested by a frozen sea and prodigious falls of snow (*mare agliazato e infinita copia de neve*); he then sailed homewards, and arrived at Lisbon on the 8th of October. Hence the above phenomena, marking the setting in of the utmost severity of an Arctic winter, must have presented themselves not later than the middle of September. Surely no one at all acquainted with the phenomena of climate can concur with the author of the Memoir in the supposition that at that season the expedition could be arrested, in the manner above described, in the Gulf of St Lawrence.

Respecting the latitude reached by Cortereal, there occur two different statements. Some make it 50°, others 60°. The author zealously adopts the former, considering it as the ultimate point reached by that navigator. So anxious is he to accumulate authorities upon this head, that he quotes first *Gomara* and then *Fumée*, as if they had been separate authors, although he knows the one to be only the translator of the other. The truth is, there is not the slightest discrepancy between the statements. There are two positions to be considered; that at which Cortereal first touched the American coast; and the one where, after sailing 600 or 700 miles, he terminated his coasting-voyage. The latitude of 50° seems evidently to correspond to the first point, where he found the *Golfo Quadrado*, the extensive pine-forests, and the country wearing a smiling aspect. The very expression of Galvano, that "he sailed *into* that climate which standeth under the north in 50 degrees," clearly implies this as the latitude at which America was reached; and this, as already observed, agrees exactly with the direction in which Cortereal sailed from Portugal. The latitude of 60° again appears as clearly to be the most northern point, where his progress was arrested by the frozen sea, and the air filled with wintry tempests; and it is remarkable, that ten degrees, the difference between these two latitudes, corresponds exactly with the space of 600 or 700 miles, which he is represented to have sailed along the American coast.

The only feature that seems at all to support our author's hypothesis, and on which indeed he seems to place his sole reliance, is the verdant and smiling aspect which the navigators

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sufficiently testified by his appearing on the sea next season with two vessels, which he steered directly to the most northerly point attained in the former voyage. Here he is described as entering a strait, Hudson's perhaps, or more probably Frobisher's; but at this critical moment the two ships were separated by a tempest, amid the floating ice with which these narrows are infested. One of them succeeded in extricating itself, and searched for some time in vain for its consort; but this last, which had on board the gallant leader of the expedition, was seen no more, and no intelligence could ever be obtained of its fate.*

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ascribed to this region. This does not exactly correspond with our ideas on the subject; but the truth is, that certain tracts wholly uncultivated, even in the neighbourhood of the Arctic circle, exhibit, when arrayed in their summer robe, an appearance peculiarly pleasing. The varied vegetation, the profusion of wild flowers, and the bushes loaded with delicious berries, compose a gayer scene than is displayed on more southern shores that are covered with the dark luxuriance of tropical foliage.

* We consider it a somewhat hasty conclusion formed by the author of the Memoir of Cabot, that it "cannot be doubted that the objects of Cortereal's second voyage were timber and slaves." This seems to harmonize very ill with the character of the navigator, and the lofty spirit of Emanuel, by whom he was employed. These objects appear, indeed, from the letter of a Venetian ambassador, to have been mentioned, but chiefly, we suspect, to satisfy that class of persons who considered mercantile profit as the only legitimate object of maritime discovery. Osorio, a very eminent Portuguese historian, who wrote the history of Emanuel's reign under the sanction of one of his sons, gives a very opposite view of the motives of Cortereal. He says, in regard to the first voyage, "Gloriæ cupiditate vehementer incensus, ad sui nominis memoriam posteris aliquo facto memorabili prodendam pertinere arbitratus est." (Powerfully inflamed by the desire of glory, he thought it concerned him to transmit his name to posterity by some memorable exploit.) With regard to the second voyage, the observation is:—"Cùm ad spem multò plura cognoscendi raperetur—ut latiùs littora illius omnia pervagaretur, et gentis mores et instituta perdisceret." (Being urged by the hope of obtaining more extensive knowledge—that he might traverse more widely all the shores of that country, and might learn thoroughly the manners and customs of the people.)—*De Rebus Emanuelis*, &c., 63.

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When these gloomy tidings were conveyed to Portugal, Miguel Cortereal, a younger brother, animated with the most tender affection for Gaspar, and with a congenial spirit of enterprise, determined to put to sea in search of him. Having equipped three vessels, he sailed on the 10th May 1502 from the port of Lisbon. On arriving at the numerous openings into Hudson's Bay, the captains adopted the plan of exploring separately the various inlets. This, however promising in some respects, was an imprudent step; for nothing could have conduced more to their mutual safety than to keep close together, and be ready to aid each other in those dreadful exigencies to which this navigation is liable. It proved a fatal measure; two of them, indeed, met and returned; but Miguel and his crew shared the fate of those whom they had gone to seek; and it was never known where or how they perished. The survivors reported at Lisbon this heavy aggravation of the former distress. Fraternal affection and daring courage seem to have characterized the whole of this noble race. There was still a third brother, Vasco Eanes, who besought of the king permission to search for his lost kindred amid the abysses of the northern ocean; but on this project a royal veto was absolutely imposed; his majesty declaring that it was more than enough to have lost in this cause two of his best and most faithful servants. After a commencement so gloomy, and such gallant efforts made in vain, it does not appear that the project of effecting a passage in the Arctic sea was ever revived in Portugal.

Spain, which had made the discovery of America, and from that success derived so much glory and wealth, might have been expected to take a deep interest in every thing connected with its farther exploration. The fact, however, appears to be, that revelling amidst the rich plains and glittering treasures of Mexico and Peru, she felt little attraction towards the bleak confines of the Northern Pole. Only one

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voyage is mentioned, that, namely, which was undertaken in 1524 by Gomez, with the view of seeking a shorter passage to the Moluccas. He is understood to have touched at Newfoundland, sailed along the coast of New England as far as the 40th degree of latitude, and returned, after a voyage of ten months, bringing with him a few of the natives, but without making any material addition to the information collected by Cabot.

Britain at last assumed the task of discovery, and made it almost exclusively her own. Her efforts, indeed, were long in vain;—the barriers of nature were too mighty;—and America, stretching her shores into regions that lie beneath the perpetual sweep of the northern tempest, renders navigation precarious and doubtful. More recently, however, she has earned high glory in this career; she has formed in it some of her greatest naval commanders; has opened new channels for the whale-fishery; fixed the limits of the western continent; and explored the wide seas and large islands which range along its remotest shores.

But even in this country there was a long interruption in maritime discovery. Henry VIII., as we formerly observed, showed from his accession almost an entire absence of the zeal manifested by his predecessor; and Sebastian Cabot, who had earned perhaps the highest name in Europe for naval skill and enterprise, finding no encouragement, resolved to transfer his services to the court of Spain. Amid this neglect, however, he seems to have preserved the strongest attachment to his native country. He repaired thither in 1517, and prevailed upon the king to fit out an expedition with the usual object of discovering a new route to the East. Unfortunately the command was intrusted, not to Cabot himself, the early and able leader of such expeditions, but to Sir Thomas Pert, who though he held the high rank of vice-admiral of England, seems to have been destitute of the qualities requisite for this arduous field of enterprise. The

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other was allowed to act only as his pilot; yet in this capacity he guided the vessel, according to his own statement in a letter to Ramusio, to the latitude of 67½° N.; and the researches of the author of "A Memoir of Sebastian Cabot" have even given reason to conclude that he actually entered Hudson's Bay, and was ascending what has since been called the Fox Channel. He considered the voyage so far as having been quite prosperous, and declares that he both could and would have gone to Cataia (China); but the courage of the commander, as well as of the crew, appears to have failed, and they refused to proceed any farther. By the unsuccessful issue of this voyage, the monarch seems to have been confirmed in his previous indifference to discovery. Cabot was again obliged to have recourse to Spain, and was soon after created grand pilot of that kingdom; nor did he return to England till the period of Henry's death.

Ten years after this failure, his majesty, urged by a strong representation on the part of Mr Thorne of Bristol, who seems to hint that on account of his apathy on this subject he was unworthy to reign, was induced to fit out another expedition for the same object. The records of it are most imperfect; though the author of the "Memoir" has found that the names of the vessels were the Mary and the Sampson, and that they reached the latitude of 53° N.; but, having probably set out too early in the season, they were arrested there by ice and snow, and turned to the southward. One of them appears afterwards to have touched at Porto Rico.

This undertaking was followed, at the distance of nine years, by another, which was set on foot by Mr Hore of London, a wealthy individual, who easily induced thirty young gentlemen of family and fortune, some of whom were from the Inns of Court, to embark along with him. In this case also Hakluyt had to lament the absence of written records; but he found out Mr Oliver Dawbeny, who sailed in one of the

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vessels; and having learned that a son of Sir William Buts of Norfolk had been of the party, and was still alive, he rode two hundred miles for the purpose of conversing with that gentleman. From these sources he was informed that the band of volunteers mustered in military array at Gravesend, and, having taken the sacrament, went on board. They had a long and tedious voyage, during which their buoyant spirits considerably flagged. At the end of two months they reached Cape Breton, then held as part of the West Indies; whence, in fulfilment of their views, they endeavoured to shape a more northerly course. They reached Penguin Island, the same probably since called Birds' Island, abounding in fowls as large as a goose, and even in bears, which made such tolerable food that all their wants were supplied. Having proceeded to Newfoundland, Dawbeny one day called on his comrades to come and view a boat with the "natural people of the country," whom they had earnestly desired to see. A barge was fitted out to treat with them; but the savages, alarmed, fled precipitately, relinquishing the side of a bear which they had been roasting; and all attempts to overtake them were fruitless. The country, indeed, appears to have been singularly barren and desolate. Food, it was said, could be procured only by purloining from the nest of an ospray the fish collected for her young. It seems strange that they should have remained on this shore, where famine soon rose to such a pitch as to drive them to a most frightful extremity. Several of them waylaid a companion, killed him, and deposited his flesh in a secret place, to which they repaired, and having roasted it in successive portions, eagerly fed upon it. An accident betrayed this dreadful secret. One of the crew, walking with a comrade who had shared in the cannibal feast, smelt the savour of broiled meat, and reproached him with keeping a private hoard, while others were in such fearful want. They came to high words, when the guilty person said,

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"Well, if you will have it, it is a piece of ———'s flesh." This being reported to the captain, he called together the ship's company; and solemnly representing to them the dreadful crime they had committed, obtained a promise that it should be carried no farther. The famine, however, becoming always more pressing, they were at length driven to the necessity of pursuing this horrible expedient systematically, and had arranged the casting of lots to decide whose life should be sacrificed to save the rest, when a French ship appeared in view. Finding it to be well stored with provisions, they scrupled not to attack and seize it, recommending the ejected crew to the ill-provided bark which they themselves had left. They made their way in all haste home, which they reached in the most squalid and miserable state. So changed was young Buts that neither Sir William nor his mother could recognise him, till he displayed a secret mark which proved him to be their son. Meantime the Frenchmen arrived in their own country, and raised loud complaints against the cruel and unwarrantable manner in which they had been treated. Henry, unable to deny the extreme hardship of their case, yet moved with pity towards his own subjects, whom he was unwilling to punish, liberally paid from his private purse the full extent of the loss.

From so slight a narrative it were rash to form any very positive conclusion; yet we cannot help observing, that there is little appearance of the adventurers having gone out duly prepared for their arduous undertaking, and little display of nautical skill, prudence, or good conduct, in the whole of the expedition.

After so disastrous an issue, the spirit of western discovery slumbered. The great zeal kindled in the succeeding reign of Edward VI. turned wholly to the eastward, producing the voyages of Sir Hugh Willoughby and others, which have been recorded in a former chapter. It was otherwise during the government of Queen Elizabeth; though that princess, however much

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inclined to favour whatever might contribute to the glory and interests of her kingdom, did not originate any of these schemes. Sir Humphrey Gilbert and Mr Richard Willis wrote treatises, where learned observations were combined with fanciful reasonings and erroneous reports; but all calculated to influence the public mind in support of such undertakings. The first voyage was planned and conducted by Martin Frobisher, an officer who afterwards distinguished himself by naval exploits in every quarter of the globe, but who earned his early fame by contending with the snows and tempests of the northern deep. Regarding the western passage as the only great thing in the world still left undone, he solicited during fifteen years, in city and court, the means of equipping a small flotilla capable of accomplishing this important object. The mercantile bodies manifested a coldness very unlike the ardour displayed on former occasions; but some influential persons proved at length more favourable, and, through the interest of the Earl of Warwick, he was enabled, in the year 1576, to fit out three vessels, respectively of 35, 30, and 10 tons. These little barks, or rather boats, seemed ill fitted for navigating the Arctic deep; yet Mr Scoresby has observed, that such vessels are better calculated for threading their way through channels obstructed by ice, and even for withstanding somewhat rude shocks from it, than larger and more unwieldy fabrics.

Frobisher, on the 8th June, dropped down from Deptford to Greenwich, where the court then resided, and, in passing the palace, fired a round in his best style. The queen looked from the windows, cheering and waving her hand, and Secretary Walsingham went on board, wished the captain success, and exhorted the crews to good order and obedience. Having on the 19th reached Yarmouth, he thence stood out to sea, and on the 26th saw before him Sumburgh Head, a bold promontory in Shetland, while he had Fair Isle to the north-west. In the remainder of his course, he only gives his distances, latitudes, and directions. On the

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11th July he saw a range of precipitous summits which, even in the height of summer, were all white with snow. He concluded this coast to be the Friesland of Zeno, but in fact it was the southern point of Greenland, near Cape Farewell. A boat put out towards the coast, but found it so barred with ice and obscured by fog that it was impossible to land. The navigators now steered westward, suffering severely from northerly gales. On the 14th the wind shattered their fore-yard, and bore the mizzenmast overboard; and on the 16th the topmast with its sail broke off, and fell into the sea. They continued, however, to press on; and upon the 22d a thick mist dispersing, showed a long line of coast, conjectured to be Labrador. Ice, however, formed an impassable barrier between them and the land, while the lead went down 100 fathoms without touching the ground. The current was very strong, but from the impossibility of coming to anchor, could not be measured; yet it seemed not less than a league and a half an hour. On the 1st August the discoverers approached to make observations on a large island of ice, which, as they were viewing it, went to pieces, and fell into the sea with a tremendous crash.

Having on the 18th reached a more accessible coast, they were desirous to ascertain if it was inhabited. Seeing seven boats plying along the beach, they sent out one of their own, the crew of which, by holding up a white cloth, induced a canoe to approach; but on seeing the ship the natives immediately turned back. Frobisher then went on shore, and, by the distribution of several little presents, enticed one of them to come on board. This person being well treated with meat and drink, made when he landed so favourable a report that nineteen followed his example. The sailors had then a full opportunity of observing this Esquimaux race. They are described as "like to Tartars, with long black hair, broad faces, and flat noses, having boats of seal-skin, with a keel of wood within the skin." Next day they appeared more shy, and with some difficulty one of them,

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by the allurement of a bell, was drawn on board. The captain, having no intention to detain him, sent a boat with five men to put him on shore at the angle of a rock; but these, urged by curiosity and blinded by false confidence, went on to join the main body of the natives —a fatal step; they were never allowed to return. Frobisher spent two days firing guns, and making inquiries at every point, but without success.

On the 26th August, without any very particular reason assigned, the navigator turned his face towards home, and reached Harwich in the beginning of October. He had made little progress towards a western passage; yet, having with such slender means penetrated thus far and discovered a new country, dignified with the title of Meta Incognita, his voyage was considered highly creditable, and as affording good promise for the future. The public interest was excited by another circumstance of a very illusory nature. All his friends importuned him to give them something or other which had come from Meta Incognita. At a loss to satisfy this desire, he cast his eyes on a large stone which, from its glittering appearance, he had been induced to take on board. He broke it into pieces, and distributed them among the circle of his acquaintances. One portion was received by a lady, who happened to drop it into the fire, where, after burning for some time, it appeared to glitter like gold. Being thereupon submitted to the goldsmiths, they were so ignorant, or so misled by the enthusiasm of the moment, as to pronounce it a valuable ore of the most precious of metals. This false decision threw all England into a ferment of joy. There was no difficulty now in equipping an expedition. The queen contributed the ship Ayde of 180 tons, besides means for enabling Frobisher to fit out two other vessels, the Michael and Gabriel, of 30 tons each. Being invited to visit the queen at Lord Warwick's seat in Essex, he was allowed to kiss her majesty's hand, and heard from her lips many gracious expressions.

He sailed again on the 26th May 1577, with such a

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"merrie wind" that on the 8th June he touched at the Orkneys for fresh water, allowing his gentlemen and soldiers to go on shore for recreation. The poor inhabitants, having, it is probable, suffered from the inroads of pirates, fled from their houses with cries and shrieks; but were soon, by courteous treatment, induced to return. Their accommodations were found truly miserable; they had no chimneys in their houses, the fire being placed in the middle of the floor, the one side of which was occupied by the family, and the other by the cattle,—while oat-cakes and ewe-milk were their only food. The discoverers now entered on their perilous voyage through the Northern Ocean, during which they were much cheered with the perpetual light, as it allowed them at all hours to read or otherwise amuse themselves; which, it is observed, is peculiarly agreeable to such as "wander in unknown seas and long navigations, where both the winds and raging surges do pass their common course." They were surprised to see large fir-trees, torn up by the roots, floating in the midst of the waves. On the 4th July, Friesland presented its awful front, a range of inaccessible mountains entirely covered with snow, unless where, from the extreme steepness of the cliffs, it had broken off and fallen into the sea. During four days' sail they saw, whenever the thick fogs dispersed, a coast equally dreary, without any landing-place, and without a sign of human habitation or even of life; yet little birds, apparently bewildered in the mist, came and alighted on board, and gave the impression that there might be a milder region in the interior. But the inexperienced part of the crew were especially struck by the islands of ice, rising thirty or forty fathoms above the water, and rooted at the bottom, which the line could not reach.

Frobisher now sailed across to Labrador, and touched at a sound which received his name. The coast, however, was found guarded by a mighty wall of ice, which the ships could not penetrate; though the captain, with two of his boats, succeeded in working his way into the

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strait, and began to survey the country. So crude were then the ideas of seamen respecting the geography of these regions, that they imagined the shore on their left to be America, and that on their right to be Asia. Landing on the former they scrambled to the top of a hill, and erected a column, which, after the great patron of the expedition, was called Mount Warwick. On their return cries were heard like the lowing of bulls, and a large body of natives ran up to them with an air of cordiality and confidence. They entered eagerly into traffic for the trifling ornaments displayed by their visiters, yet declined every invitation to go on board; while the English, on the other hand, did not choose to accede to their proposal of going into the country. Frobisher and one of his people meeting two of the natives apart, rashly attempted to drag them to the boats, hoping there to gain their friendship by presents and good usage. On the slippery ground, however, their feet gave way, the Esquimaux broke loose, and found behind a rock their bows and arrows, which they began to discharge with great fury. The captain and his companion, seized with a panic scarcely justified by two such miserable assailants, fled full speed, and the former reached the barge with an arrow sticking in his leg. The crew, imagining that something serious must have happened to their commander, gave the alarm, and ran to the rescue. The two barbarians instantly retreated; but Nicholas Conger, a stout fellow, servant to Lord Warwick, seized one of them and dragged him into the boat.

Meantime the ships outside were involved in a dreadful tempest, being tossed amid those tremendous ice-islands, the smallest of which would have been sufficient to have crushed them into a thousand pieces. To avoid dangers which so closely beset them, they were obliged to tack fourteen times in four hours; but with the benefit of constant light, the skill of their steersman, and the aid of Providence, they weathered the storm without being compelled to drive out to sea and abandon

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their friends ashore. On the 19th Frobisher went aboard, carrying with him a large store of glittering stone; upon which, says Dionise Little, "we were all rapt with joy, forgetting both where we were and what we had suffered. Behold," says he, "the glory of man,—to-night looking for death, to-morrow devising how to satisfy his greedy appetite with gold."

A north-west gale soon sprung up; before which, like magic, the mighty barriers of ice by which they had been shut out from the land melted away. They had now a broad and open passage, whereby they entered the Sound, which, in their imagination, was still identified with a strait leading into the Pacific Ocean. In a run of more than thirty leagues they landed at different points, and, mounting to the tops of hills, took possession of the country, with solemn ceremonies, in name of her majesty. Having found in one place a bridle of singular construction, they examined their captive upon it, who thereupon seized a dog, attached the bridle, yoked the animal in a sledge, and exhibited the Esquimaux mode of driving. This person admitted that he was not entirely ignorant respecting the five men captured the preceding year, but repelled most strenuously the insinuation that they had been killed and eaten. However, a dark source of suspicion was soon opened; for in some of their boats were found, along with bones of dogs, flesh of unknown animals, and other strange things, an English canvass doublet, a shirt, a girdle, three shoes for contrary feet,—apparel which, beyond all doubt, belonged to their lost countrymen. Anxiously hoping to recover them, they left a letter in the boat, and pen, ink, and paper, with which to return an answer. With the same view, still more vigorous measures were adopted. Forty men, under Charles Jackman, marched inland to take the natives in the rear, and drive them upon the coast, where Frobisher with a party waited to intercept them. The savages, meanwhile, had removed their tents into the interior; but the invaders, after proceeding over several moun-

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tains, descried another cluster of huts, supposed at first to belong to a different horde. The agitation and alarm, however, which were visible the instant our countrymen were observed, showed that this was the guilty band; and, accordingly, hastening to their canoes, and pushing out full speed to sea, they rowed with a rapidity which would have baffled all pursuit, had not the captain with his boats held the entrance of the sound. As soon as they saw themselves thus beset, they landed among the rocks, abandoning their skiffs, which they hoped to render useless by breaking the oars. The English immediately rushed to the assault; while the natives stationed on the rocks resisted the landing, and stood their ground with the most desperate valour. Overwhelmed with clouds of arrows, they picked them up, plucking them even out of their bodies, and returned them with fury. On feeling themselves mortally wounded, they plunged into the sea, lest they should fall into the hands of the conquerors. At length, completely worsted, and having lost five or six of their number, they sprang up among the cliffs and eluded pursuit. There fell into the hands of the assailants only two females, who caused some speculation. One was stricken in years, and presented a visage so singularly frightful as to suggest to some of the crew the uncomfortable suspicion that the great enemy of mankind stood before them in person. This impression gaining ground, it was resolved to ascertain whether or not she possessed the cloven foot. Her buskins were plucked off, to satisfy the credulous sailors as to the fact whether she did not present that peculiar structure of the lower extremities supposed to characterize the dread foe of the human race. As this essential mark was found wanting, it was instantly determined, by liberating her, to deliver their eyes from so hideous a spectacle. The other female was young, with a child in her arms; and being, from her peculiar costume, mistaken for a man, had been fired at and the infant wounded. It was in vain to apply remedies; she licked

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off with her tongue the dressings and salves, and cured it in her own way. She and the male captive formerly taken looked strange at first; but on becoming intimate, found much comfort in each other's society, and showed a strong mutual attachment.

Frobisher still cherished hopes of discovering his men. A large party appearing on the top of a hill, signs were made of a desire for mutual accommodation. A few of them advanced, and were introduced to the captives. The parties were deeply affected, and spent some time without uttering a word; tears then flowed; and when they at last found speech, it was in tones of tenderness and regret, which prepossessed the English much in their favour. The captain now assured them that, on condition of their restoring his five men, they should receive back their own friends, with the addition of sundry of those little articles on which they set the highest value. This they promised, and also to convey a letter to the prisoners. Doubtless by this time these unfortunate individuals no longer lived, and the natives consequently had no means of redeeming their pledge; but they determined, by force or stratagem, to effect their purpose. Three men appeared holding up flags of bladder, inviting the Europeans to approach; but the latter, who saw the heads of others peeping from behind the rocks, resolved to proceed with the utmost caution. The savages began by placing in view large pieces of excellent meat; and when their enemy could not be caught by that bait, one of them advanced very close, feigning lameness, and seeming to offer himself an easy prey. Frobisher allowed a shot to be fired, by which this person was cured at once, and took to his heels. Seeing all their artifices fail, the barbarians determined upon main force, and pouring down to the number of a hundred, discharged their arrows with the greatest fury. They even followed a considerable way along the coast, regardless of the shot directed against them by the sailors; these last, in the mean time, being too distant from the shore to suffer the slightest annoyance.

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Several of his men, indeed, asked permission from their leader to land and attack the barbarians; but this he refused, as only calculated to defeat their main object, and to cause useless bloodshed.

The 21st of August had now arrived, the ice was beginning to form around the ships, and though little progress had been made towards China, the crews had put on board two hundred tons of the precious mineral. They therefore mounted the highest hill, fired a volley in honour of the Countess of Warwick, and made their way home.

Notwithstanding the vicissitudes which had marked this voyage, the arrival of the ships was hailed with the utmost exultation. Enthusiasm and hope, both with the queen and the nation, rose higher than ever. The delusion of the golden ore continued in full force, and caused those desolate shores to be regarded as another Peru. Special commissioners, men of judgment, art, and skill, were named by her majesty to ascertain both the quality of the shining substance and the probability of effecting a voyage to India. After due inquiry, a most favourable report was made on both subjects, recommending not only that a new expedition on a great scale should be fitted out, but a colony established on that remote coast, who might at once be placed in full possession of its treasures, and be on the watch for every opportunity of farther discovery. To brave the winter of the Polar regions was a novel and daring enterprise; yet such was then the national spirit, that the appointed number of a hundred was quickly filled up. There were forty mariners, thirty miners, and thirty soldiers, in which last number were oddly included not only gentlemen, but gold-finers, bakers, and carpenters. Materials were sent on board the vessels fit for being converted into a fort or house. The squadron was the largest that had yet ventured to plough the northern deep. It consisted of fifteen vessels, furnished by various ports, especially by those of the west; and the rendezvous took place at Harwich on the 27th May 1578, whence they sailed

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on the 31st. The captains waited on the queen at Greenwich, and were personally addressed by her in the most gracious manner,—Frobisher receiving a chain of gold, and the honour of kissing her majesty's hand.

It has been already observed, that expeditions got up on the greatest scale, and with the most ample means, have usually proved the most unfortunate. A numerous fleet is ill calculated to steer through the ice-entangled straits, and amid the huge masses which are found floating in all parts of the Arctic ocean. On reaching the Queen's Foreland, at the opening of Frobisher's Strait, the navigators found it frozen over from side to side, and barred as it were with successive walls and bulwarks. A strong easterly wind had driven many icebergs upon the coast, and hence the situation of the mariners soon became very perilous. The Dennis, a large vessel, on board of which was part of the projected house, received such a tremendous blow from a mountain of ice, that it went down almost instantly, the men being with difficulty saved by another ship which hastened to their aid. This spectacle alarmed the other crews, who felt that the same fate might next moment be their own. The danger was much augmented when the gale increased to a tempest, and the icy masses, tossing in every direction, struck furiously against the sides of the vessels. Invention was now variously at work to find means of safety. Some moored themselves to these floating islands, and being carried about along with them, escaped the tremendous concussions which they must otherwise have encountered. Others held, suspended by the sides of the ship, oars, planks, pikes, poles, every thing by which the violence of the shocks might be broken; yet the ice, "aided by the surging of the sea and billow," was seen to break in pieces planks three inches thick. The commander considers it as redounding highly to the glory of his poor miners and landsmen, wholly unused to such a scene, that they faced with heroism the assembled dangers that besieged them round. "At length it pleased God with his eyes

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of mercy to look down from heaven,"—a brisk south-west wind dispersed the ice, and gave them an open sea through which to navigate.

Having spent a few days in repairing his squadron, Frobisher again used all his efforts to penetrate to the spot where he was to found his colony. After considerable exertion he made his way into the strait, when he discovered that he was sailing between two coasts; but owing to the mists and thick snow which darkened this northern midsummer, nothing could be distinctly seen. As, however, clear intervals occasionally occurred, affording partial glimpses of the land, the surmise arose, that this was not the shore along which they had formerly sailed. Being little inclined to listen to a doubt which would have convicted him of having thrown away much of his time and labour, he still pressed onwards. Once the mariners imagined they saw Mount Warwick, but were soon undeceived. At length Christopher Hall, chief pilot, stood up and declared, in the hearing of all the crew, that he never saw this coast before. The commodore still persevered, sailing along a country more populous, more verdant, and better stocked with birds, than the one formerly visited. In fact this was probably the main entrance into Hudson's Bay, by continuing in which he would have made the most important discoveries. But all his ideas of mineral wealth and a successful passage to India were associated with the old channel; and, on being obliged to own that this was a different one, he resolved to turn back. In this retreat the fleet was so involved in fogs and violent currents, and so beset with rocks and islands, that the sailors attributed to a special interposition of Providence the fact of their getting out in safety. When they had reached the open sea, and arrived at the mouth of the desired strait, it was almost as difficult to find an entrance. However, the resolute navigator was constantly on the watch, and wherever there appeared any opening, it is said, "he got in at one gap and out at another," till at length he reached his purposed haven in the

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depths of the North. But, before the crews were completely landed, the 9th of August had come, thick snows were falling, and it behoved them to hold a solemn consultation as to the expediency of persevering in the establishment of the projected colony. There remained of the house only the materials of the south and east sides; the rest had either gone down in the Dennis, or been shattered into fragments while suspended from the ships to meet the strokes of the ice. Great part of the bread was spoiled, and the liquors had sustained a woful leakage; in short, there was no longer an adequate provision for a hundred men during a whole year. In hese circumstances Captain Fenton of the Judith suggested, that what remained of the house might be formed into a hut for sixty men, with whom he undertook to pass the winter; but the carpenters being consulted, declared that such a structure could not be erected in less than two months, while their stay could not possibly be protracted beyond twenty-six days. Renouncing the idea of settlement, Frobisher still asked his officers whether they might not, during the remaining interval, attempt some discovery to throw a redeeming lustre on their unfortunate enterprise; but in reply, they urged the advanced season, the symptoms of winter already approaching, and the danger of being enclosed in these narrow inlets, where they would be in the most imminent danger of perishing;—in short, that nothing was now to be thought of but a speedy return homewards. This was at length effected, not without the dispersion of the fleet, and considerable damage to some of the vessels.

The record of these voyages contains notices of the country and people, which strikingly agree with those collected by recent navigators. This Meta Incognita, which includes only the countries near the entrances of Hudson's Bay, is considered as a cluster of large islands, separated by narrow inlets,—an idea perhaps not so unfounded as was for some time supposed,—and consisting of high lands, covered with snow even in the midst of

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summer. The navigators were surprised to find in latitude 60° and 61° a cold much more intense than at the North Cape and Wardhuys in latitude 72°. The people are described as of a ripe olive complexion, with long black hair, broad faces, and flat noses, much resembling Tartars, or, more strictly, Samoiedes, to whom, according to the best information Frobisher could obtain, they were also similar in their habits of life. The land could scarcely yield either grain or fruit, and the inhabitants made no attempt to cultivate them, eating merely shrubs and grass, "even as our kine do;" or, as Settle expresses it, "such grass as the country produceth they pluck up and eat, not daintily or saladwise, but like brute beasts devouring the same." In other respects, he observes, they seek "by their hunting, fishing, and fowling, to satisfy their greedy paunches, which is their only glory." They use neither seat, table, nor cloth; but, "when they are imbrued with blood knuckle deep, they use their tongues as apt instruments to lick them clean." From the disgusting manner in which they devoured their meat, very often in a putrid state, without any attempt at cookery, an inference is somewhat rashly drawn, that they would not make the least hesitation to partake of human flesh. Frobisher saw only their summer-houses, which are described as poor caves, like ovens, having for doors holes resembling those of a fox or cony burrow. They are said to be formed of pieces of whalebone meeting at top, and covered with seal-skin, and to have in the inside a layer of moss, which serves for beds to sleep on. At the same time they were found to be sharp-witted, and showed by signs great readiness, both in their understanding and replies. If they could give no information on any subject, they shut their eyes; if they did not comprehend what was said to them, they stopped their ears. They took the greatest delight in music; repeating and keeping time to any tune with voice, head, hand, and foot. Their darts, arrows, and other weapons, were skilfully contrived, and used with a courage amounting even to desperation, of which

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Kayak, or Greenlander's Canoe.

repeated instances have been given. Their little boats of skin (kayak) were moved by one oar, with a swiftness which no English sailor could match. The astonishment of one of them was very great when he saw himself in a mirror. "He was upon the sudden much amazed thereat, and beholding advisedly the same with silence a good while, at length began to question with him as with his companion; and finding him dumb, seemed to suspect him as one disdainful, and would have grown into choler, until at last, by feeling and handling, he found the deceit, and then, with great noise and cries, ceased not wondering, thinking that we could make men live and die at our pleasure." Great signs of mutual attachment appeared between the male and female captives who were brought home on the second voyage. She killed and dressed the dogs for him, and tended him carefully when sick, while he, on the other hand, picked out the sweetest and fattest morsels, and laid them before her; yet they lived entirely as brother and sister, without the slightest impropriety.

Our naval records do not inform us of the feelings excited in the nation by the return from this perilous and unsuccessful voyage. The failure of repeated attempts, and especially of one got up with so much cost, probably produced the usual effect of indifference and despondency. The glittering stone, which was to have converted this northern Meta into another Peru, was never more heard of; a few careful assays having doubtless established its utter insignificance. Frobisher recommended strongly a trial of the first inlet which he

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had entered, as being, in comparison of the other, broader, and every way more promising; but the public could by no means be roused to any farther efforts, and he was obliged to seek in other climates employment for his daring and active spirit. He accompanied Sir Francis Drake to the West Indies; he commanded one of the largest ships in the fleet which opposed the Spanish Armada; and fought with such bravery that he was decorated with the honours of knighthood. Being afterwards sent to assist Henry IV. against the League, he was employed in the attack of a small fort on the coast of France, where he received a wound from a ball, which, through unskilful treatment, proved fatal in November 1594.

Seven years after Frobisher's last voyage, the spirit of the nation was again roused. Divers opulent merchants of London and of the west determined to "cast in their adventure;" and, leaving wholly out of view the delusive hopes of gold which had misled the captain now named, directed theirs entirely to the discovery of a passage to India. They fitted out two vessels, the Sunshine and Moonshine, of 50 and 35 tons respectively, which were placed under the command of John Davis, a steady and determined seaman. He was endowed also with a large portion of good humour, by which he was likely to render himself acceptable to the rude natives of those inhospitable shores; and to promote still farther this important object, he was provided, not only with an ample supply of the gifts most suited to their taste, but with a band of music to cheer and recreate their spirits. On the 7th June 1585 he set sail from Dartmouth; and on the 19th July, as he approached the Arctic boundary, the seamen heard, amid a calm sea covered with thick mist, a mighty roaring, as of waves dashing on a rocky shore. Though the soundings gave 300 fathoms, the captain and master pushed off in the boat to examine this supposed beach, and were much surprised to find themselves involved amid numerous icebergs, and that all this noise had been caused by the

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rolling and beating of these masses against each other. He landed on several of these floating islands, and broke off pieces of ice, which, being carried to the ship, were converted into good water. Next day he came in view of the south-western coast of Greenland, which appeared the most dreary and desolate ever seen; "deformed, rocky, and mountainous, like a sugar-loaf, standing to our sight above the clouds. It towered through the fog like a white list in the sky, the tops altogether covered with snow, the shore beset with ice, making such irksome noise that it was called the *Land of Desolation*." The water on this coast was black and thick, like a standing pool, and though they saw many seals floating, and birds beating upon the surface, none could be caught.

After sailing several days along this dreary shore, without being able to approach on account of the ice, Davis pushed out north-westward into the open sea, hoping in "God's mercy to find our desired passage." On the 29th he came in sight of a land in 64° north latitude, which was still a part of Greenland; but as the wind was unfavourable for proceeding in the proper direction, while the air was temperate, and the coast free from ice, he resolved to go on shore and take a view of the country and people. Accompanied by only two individuals, he landed on an island, leaving directions for the rest to follow as soon as they should hear a signal. The party mounted the top of a rock, whence they were espied by the natives, who raised a lamentable noise, with loud outcries like the howling of wolves. Davis and his comrades hereupon struck up a high note, so modulated, that it might at once amuse the savages and put his own crew on the alert. Burton, the master, and others hastened, well armed, yet with the band playing, and dancing to it with the most inviting signs of friendship. In accordance with this gay summons, ten canoes hastened from the other islands, and the people crowded round the strangers, uttering in a hollow voice unintelligible sounds. The English con-

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tinued their friendly salutations, while the Esquimaux still showed signs of jealousy and alarm, when at length one of them began to point towards the sun and beat his breast. These signs being returned by John Ellis, master of the Moonshine, they were induced to approach; when, on being presented with caps, stockings, gloves, and other articles, their fears gave place to the most cordial amity. Next day there appeared thirty-seven canoes, the crews of which kindly invited the strangers on shore, expressing the utmost impatience at their delay. Davis manned his boats and went to them; upon which one of their number, after shaking his hand, kissed it, and all resigned themselves to confidence and affection. The barbarians parted with every thing, the clothes from off their backs, consisting of seal-skins, and birds' skins with the feathers on them, their buskins of well-dressed leather, their darts, oars, and five canoes, accepting cheerfully in return whatever their new visiters chose to give, and kindly aiding each other under the privations thus occasioned. They offered to return next day with an ample store of furs and skins, which they saw the foreigners value so highly; but a favourable breeze springing up, the captain very properly determined to allow nothing to interfere with his schemes of discovery. He steered directly across the strait, or rather sea, which still bears his own name. On the 6th August he discovered high land, which he named Mount Raleigh, being part of Cumberland Island. Here, anchoring in a fine road, the seamen saw three white animals, which seemed to be goats. Desirous of fresh victuals and sport, they pursued them, when they soon perceived that they were in chase of three monstrous bears. The animals rushed on with great fury, till, being received with several balls, they retreated, apparently not much hurt, but were followed and at last killed. There were no symptoms of their having fed on any thing except grass; but it was necessary to clear away a very large quantity of fat before the flesh could be eaten.

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Davis, after coasting about for some days, again found himself at the cape which he had at first reached on his crossing from the opposite shore of Greenland. This promontory, which he called God's Mercy, he now turned, when he entered a sound stretching north-westward, twenty or thirty leagues broad, free from ice, and its waters having the colour and quality of the main ocean. After proceeding sixty leagues, he observed an island in the mid-channel, which still, however, afforded an open passage; so that his hopes daily increased, till about the end of August, when being involved in fogs and contrary winds, he determined to suspend operations for the season and return to England.

On one of the islands in this sound the seamen heard dogs howling, and at length saw twenty of them approach, having the appearance of wolves. Impressed, however, with the idea that only animals of prey could be found on these shores, they fired and killed two, round one of whose necks they found a collar, and soon afterwards discovered the sledge to which he had been yoked. Davis observed abundance of the black and glittering stone of Frobisher, and many of the rocks appeared "orient like gold;" but little attention was now excited by these delusive appearances.

Although nothing was actually done by this expedition, yet the views which it had opened up inspired sanguine hopes, and facilitated the equipment of a fresh expedition. To the slender armament of the Sunshine and Moonshine was now added the Mermaid of 120 tons, with a boat or pinnace. Davis sailed again from Dartmouth on the 7th May, and on the 15th June came in view of the southern extremity of Greenland; but, owing to severe storms, it was the 29th before he reached the land formerly visited in lat. 64°. As he approached, the natives came out in their canoes at first with shouts and cries; but, recognising their companions of the preceding year, they hastened forward, and hung round the vessel with every expression of joy and welcome. Seeing them in such favourable dispositions, the

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captain went ashore and distributed in presents twenty knives, refusing the offer of skins in return. The most intimate acquaintance was now resumed; yet they never met the strangers anew without crying "*Iliaout!*" beating their breasts and lifting their hands to the sun, by which a fresh treaty was ratified. The two parties amused themselves by contests in bodily exercises. The Esquimaux could not match their opponents in leaping; but in wrestling they showed themselves strong and skilful, and threw some of the best among the sailors. By degrees they began to manifest less laudable qualities. They exercised many and solemn incantations, though, Davis thanks God, without any effect. They kindled a fire by rubbing two sticks against each other, and invited him to pass through it; but he, in contempt of their sorcery, caused the fire to be trodden out and the embers thrown into the sea. They also showed the very inconvenient propensity of appropriating every article, especially iron, which came under their notice. Perhaps it was imprudent ever to have made presents, thus suggesting the idea, which does not seem to have before entered their minds, that any thing might be obtained without an equivalent. Be this as it may, they soon reached the highest pitch of audacity; they stole a spear, a gun, a sword, cut the cables, and even the Moonshine's boat from her stern. The principal officers remonstrated with the captain, and reminded him, that for their security he must "dissolve this new friendship, and leave the company of those thievish miscreants." He fired two pieces over their heads, which "did sore amaze them," and they fled precipitately. But in ten hours they again appeared, with many promises and presents of skins; when, on seeimg iron, "they could in nowise forbear stealing." The commander was again besieged with the complaints of his crew; however, "it only ministered to him an occasion of laughter," and he bid his men look vigilantly to the safety of their own goods, and not deal hardly with the natives, who could scarcely be expected in so short a time "to know their evils."

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Davis now undertook an expedition to observe somewhat of the interior. He sailed up what appeared a broad river, but which proved only a strait or creek. A violent gust of wind having obliged him to seek the shelter of land, he attempted to ascend a very lofty peak; but "the mountains were so many and so mighty, that his purpose prevailed not." While the men were gathering muscles for supper, he was amused by viewing, for the first time in his life, a waterspout, which he describes as a powerful whirlwind, taking up the water and whisking it round for three hours without intermission. Next day he re-embarked, and penetrated higher up the channel; but was surprised to find, instead of the huge unbroken continent which he had supposed, only waste and desert isles, with deep sounds and inlets passing between sea and sea.

During the captain's absence matters had become worse with the Esquimaux, and on his return the sailors opened a fearful budget; stating that the natives had stolen an anchor, cut the cable, and even thrown stones of half a pound weight against the Moonshine; and he was asked if he would still endure these injuries. Davis, who probably suspected that their own dealings had not been very gentle, bid them have patience, and all should be well. He invited a party of the savages on board, made them various little presents, taught them to run to the topmast, and dismissed them apparently quite pleased. Yet no sooner had the sun set than they began to "practise their devilish nature," and threw stones into the Moonshine, one of which knocked down the boatswain. His meek spirit was at length kindled to wrath, and he issued orders for two boats to chase the culprits; but they rowed so swiftly that the pursuers soon returned with "small content." Two days after, five of them presented themselves with overtures for a fresh truce; upon which the master came to Davis, declaring that one of them was "the chief ringleader, a master of mischief," and urged vehemently not to let him go. He was made captive, and a fair wind suddenly

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springing up, the discoverers set sail, and carried him away, many doleful signs being exchanged between him and one of his countrymen; however, on being well treated, and supplied with a new suit of frieze, his spirits revived, he became a pleasant companion, and used occasionally to assist the sailors.

Davis, finding the wind favourable, pushed across the bay, in hopes of attaining the object of his voyage. On the 17th July the ship's company descried a land diversified with hills, bays, and capes, and extending farther than the eye could reach; but what was their disappointment on approaching, to find that it was only "a most mighty and strange quantity of ice!" It was, in fact, that immense barrier which often, for a great part of the season, fills the middle of Baffin's Bay. As they coasted along this wide field a fog came on, by which the ropes, shrouds, and sails, were all fast frozen,—a phenomenon which, on the 24th July, appeared more than strange. Dismayed by these appearances, the seamen considered the passage hopeless, and, in a respectful yet firm tone, warned Davis, that by "his over-boldness he might cause their widows and fatherless children to give him bitter curses." He was not unwilling to consider their case; yet, anxious not to abandon so great an enterprise, he determined to leave behind him the Mermaid, as a vessel less convenient and nimble, and to push on in the Moonshine with the boldest part of his crew. Having found a favourable breeze, he at last, on the 1st August, turned the ice, and in lat. 66° 33′ reached land; along which he now coasted southwards for about ten degrees, entangled among a number of islands, and missing in his progress the different inlets which afforded an entrance into Hudson's Bay. The shores were crowded with incredible flocks of gulls and seamews, and the water so abounded in fish that, though their tackle was very indifferent, in the running of an hour-glass the crew caught a hundred cod. On reaching Labrador, the coast was seen covered with ample forests of pine, yew, and birch; but five men who landed were

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beset by the natives, and all killed or wounded except one. The ship, too, being exposed to a violent tempest, and September now approaching, the captain judged it wisest to return to England.

The public mind was considerably damped by the issue of this expedition; so that Davis found no small difficulty in obtaining the means for equipping another. He was obliged to hold out the inducement that, by proper arrangements, the outlay might be defrayed by fishing, and no additional expense incurred on account of discovery. By these arguments, and by the exertions of his zealous friend, Mr Sanderson, he succeeded in fitting out the Sunshine, the Elizabeth, and a pinnace. This last, to which he mainly trusted for discovery, answered very ill the character which had been given of it, and was found to move through the water like a cart drawn by oxen. On the 16th June 1587 the adventurers arrived at their old coast, and were received by the natives as before with the cry of *iliaout* and the exhibition of skins. These savages, however, lost no time in renewing their former system of thieving; for which great opportunities were afforded during the putting together of a boat consisting of materials brought from England. They carried off the deals, and when fired at placed them before their bodies as shields, thus securing both their planks and persons. It was now arranged that the two large vessels should remain to fish, while Davis in the pinnace stretched out into a higher latitude with a view to discovery. In pursuance of this plan he took his departure; and, continuing to range the coast to the northward, on the 28th he reached a point, which he named Sanderson's Hope, in upwards of 72 degrees, still finding a wide open sea to the west and north. Here, the wind having shifted, he resolved to hold on a western tack across this sea, and proceeded forty leagues without sight of land or any other obstruction, when he was arrested by the usual barrier of ice. He first endeavoured to round it by the north, but, seeing no passage on that side, turned to the south, beating

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about several days without success. Tempted by an apparent opening, he involved himself in a bay of ice, from which he was not extricated without much difficulty and some danger; being obliged to wait till the sea beating and the sun shining on this mighty mass should effect its dissolution or removal. At length, on the 19th July, he came in view of Mount Raleigh, and at midnight found himself at the mouth of the inlet discovered in the first voyage, and which has since been called Cumberland Strait. On the morrow he sailed across its entrance, and in the two following days ascended its northern shore, till he was again involved among numerous islands. He seems now to have concluded that this strait must be an enclosed gulf, and shaped his course to reach the sea; but, being becalmed in the bottom of the bay, he could not till the 29th, by coasting along the southern shore, effect his retreat. Frobisher's Strait was now passed, seemingly without being recognised as such, but was called Lumley's Inlet. He next crossed the mouth of an extensive gulf, in one part of which his vessel was carried along by a violent current, while in another the water was whirling and roaring as is usual at the meeting of tides. This recess, being terminated by Cape Chidley, was evidently the grand entrance afterwards penetrated by Hudson. Having now, however, only half a hogshead of water left, he hastened to the point of rendezvous fixed with the two other vessels; when, to his deep disappointment and just indignation, he found that they had departed. It was not without hesitation that, with the slender store remaining in his little bark, he ventured to sail for England; but having scarcely any alternative, he undertook the voyage, and happily accomplished it.

Davis wrote once more to Mr Sanderson in sanguine and almost exulting terms. He had reached a much higher latitude than any former navigator, and with the exception of the barrier of ice on one side, had found the sea open, blue, of vast extent and unfathomable depth. He considered, therefore, that the success

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of a spirited attempt was almost infallible. But the interest taken by the public in such enterprises seems only capable of being sustained for a certain period. Three failures had exhausted that interest, and made men indisposed to listen or inquire further into the subject. It became the cry, as he informs us,—"This Davis hath been three times employed; why hath he not found the passage?" The death of Secretary Walsingham, occurring at this period, was a severe blow to the cause; while the invasion by the Spanish Armada soon followed, and engrossed for a space all the thoughts and energies of the nation. Mr Sanderson still continued the steady friend of the navigator; but, unable to obtain resources for a new attempt, he could only employ Molyneux, the best artist of his time, to construct a globe which comprised all his friend's discoveries, and is still preserved in the library of the Middle Temple.

In 1602 the spirit of enterprise revived. To the Muscovy Company, who had taken the lead in all the early schemes of discovery, was now added the Levant Company; and these two great bodies, finding the course to India by the Cape still beset with many dangers, determined upon a joint effort to penetrate thither by the north-west. They sent out Captain George Weymouth with two vessels, the Discovery and God-speed, which they called fly-boats, though they were respectively of 70 and 60 tons. He left London on the 2d May, and on the 18th June came in view of the coast of Greenland, which appeared to him "a main bank of ice." The water was in many places as thick as puddle, making him imagine himself among shallows, till the sounding-line gave 120 fathoms without any ground. This, which was formerly observed by Davis, is probably the green cloudy sea of Scoresby, thickened by the infusion of numberless animalcules.

Weymouth having made sail westward with a favourable breeze, came on the 28th in sight of the

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coast of America. There appeared a promontory covered with snow, which he concluded to be Warwick's Foreland; but the vessels were tossed to and fro by violent currents, or overfalls, as he calls them, and involved in fogs so thick, that they were once quite close to a bank of ice before it was perceived. However, being in want of water, the party landed, loaded their boat with ice, and found it to make very palatable drink. The attention of the crews was arrested by a loud sound like the dashing of waves on the shore; and on approaching the place they were dismayed to find it "the noise of a great quantity of ice, which was very loathsome to be heard." The mist became so thick that they could not see two ships' length, and determined to take down the sails; but were petrified to find them so fast frozen to the rigging, that, in "this chiefest time of summer, they could not be moved." Next morning they renewed the attempt; but it was only by cutting away the ice from the ropes that they could be made to pass through the blocks. The following day the fog lay so thick, and froze so fast, that ropes, sails, and rigging, remained immovable.

These phenomena produced an unfavourable effect on the minds of the sailors, who began to hold secret conferences, ending in a conspiracy "to bear up the helm for England." It was proposed to seize Weymouth, and confine him in his cabin till he gave his consent; but he, receiving notice of this nefarious design, summoned the seamen before him, and, in presence of Mr Cartwright the preacher and Mr Cobreth the master, called upon them to answer for thus attempting to defeat a voyage fitted out at such ample cost by the honourable merchants. The men stood firm, producing a paper signed by their own hands, in which they justified the proposed step as founded on solid reason, without any tincture of fear or cowardice. They represented that if they should suffer themselves to be enclosed in an unknown sea, by this dreadful and premature winter, they would not only be in

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imminent danger of perishing, but could not hope to commence their career of discovery next year sooner than May; while by setting sail in due time from England they might easily reach this coast in that month. He retired to his cabin to deliberate, when he was soon informed that the helm was actually borne up. Hastening on deck, and asking who had done this, he was answered, "One and all!" and he found the combination such as it was impossible to resist, though he took occasion afterwards to chastise the ringleaders. The men, however, declared themselves ready to hazard their lives in any discovery which might be attempted to the southward.

Accordingly, on descending to lat. 61° N., the captain perceived the entrance of an inlet, into which he sailed, in a south-west direction, a hundred leagues by reckoning; but, encountering fogs and heavy gales, and finding the season far spent, he deemed it necessary to regain the open sea. This inlet, however, was thought to present more favourable hopes of a passage than any other that had yet been discovered. It appears in fact to have been the grand approach to Hudson's Bay; so that Fox justly ascribes some merit to Weymouth for directing his distinguished successor into this spacious expanse. Still, as his course of west by south must have led him from the main channel of this large strait, and thrown him on the western shore of what is now called Ungava Bay, his estimated reckoning of a hundred leagues is evidently overrated. In 55° he found a fair land, consisting of islands and "goodly sounds," apparently the place where the Moravian settlement of Nain was subsequently formed. Soon afterwards a dreadful hurricane from the west seemed to take up the sea into the air, and drove the ships before it with the utmost impetuosity. Had it been from any other quarter they must have been dashed to pieces on rocks; however, they ranged through the open waters, and in the greatest extremity "the Lord delivered us his

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unworthy servants." They had now an easy navigation to England.

No farther proceedings occurred till 1606, when the Muscovy and East India merchants fitted out a vessel of 40 tons under John Knight, who, having been employed in the Danish voyages to Greenland, was considered a stout and enterprising sailor. He sailed from Gravesend on the 18th April, but was detained a fortnight in the Pentland Frith; however, "two lustie fellows, well acquainted with these north parts of Scotland," took him into a good harbour called St Margaret's Hope, where he remained till the 12th May. He directed his course almost due west, towards America, and had reached the latitude of 58°, when winds and currents bore him to the southward. On the 19th June he was in 56° 48′, when he saw the continent rising like eight islands. The vessel, meantime, had been so distressed with tempests and heavy fogs, and so bruised between floating icebergs, that it was necessary to put her into a little cove to refit. Here the wind blew with such violence, bringing great masses of ice against the bark, that the rudder was torn from the stern; and hence it became necessary to hale it on shore at the bottom of the bay, that it might undergo a thorough repair.

On the 26th, Knight, with some of his men well armed, went across to the opposite coast, in search of a better harbour, and to take a survey of the adjacent country. With this view, accompanied by his mate and another, he went over a hill, leaving three persons in charge of the boat. These last waited the whole day in anxious expectation of the return of the party; they then sounded trumpets, fired muskets, and made every imaginable signal, but without effect. After remaining till eleven at night, they gave up hopes, and returned to the ship with these doleful tidings. The crew were struck with the deepest dismay, at having thus lost their captain and best officers, and being themselves left in such deplorable circumstances. The

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boat was fitted out next morning for search, but could not cross the channel on account of the ice. After two distressful days, on the night of Saturday the 28th June, as the boatswain was keeping watch in advance of the tents, he suddenly saw, rushing through the darkness, a great body of men, who, on descrying him, let fly their arrows. He instantly fired and gave the alarm; but before his comrades could start from bed and be mustered, the sloop was filled with savages, who, to the number of fifty, with loud cries and menacing gestures, showed themselves prepared for immediate attack. The English mustered only eight men and a large dog, and though the rain fell in torrents, they determined rather to perish bravely in assailing the enemy, than to await their onset. They advanced, therefore, placing the dog in front. This bold measure appalled the barbarians, who leaped into their skiffs, and made off with all speed; but being entangled in the ice, they were detained a considerable time, during which the pursuers continued firing, and the savages were heard "crying to each other very sore." They are represented, so far as could be judged, as a people of very small stature, tawny-coloured, with thin beards, flat-nosed, and man-eaters; but this last particular was doubtless a matter of mere inference.

The mariners, placed in this alarming situation, made all the haste they could to fit their shattered bark for again taking the sea. They had first to cut a way for her through the ice; but they had nothing which could be called a rudder, and the leaks were so large that they could scarcely enjoy half an hour's relief from the pump. At length they found means to stop up in some degree the principal fissure, and, after hard rowing for three weeks, succeeded in reaching the coast of Newfoundland. Among the fishing-vessels on that station they met most kind and loving friends, who supplied all their wants; and, after twenty days spent in repairing their ship and refreshing their bodies, they enjoyed a good passage to Dartmouth, whence

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they transmitted to London an account of the unfortunate issue of their voyage.

Hudson again assumed the most prominent place in the career of northern discovery, and earned a fame which has ranked him among the greatest of British navigators. We have traced his progress in former chapters,—first in the daring attempt to cross the Pole itself; then in his second voyage towards the north-east; and also in his third excursion, which ended in the discovery of the river now associated with his name. But the most eventful of his enterprises was the one which closed his labours, undertaken with the view to a western passage. The narrative of the commander himself is only a meagre journal, brought down to a particular date; but a full relation is given by a certain personage, naming himself Abacuk Pricket, against whose testimony, however, for reasons that will appear in due time, there rest some heavy objections.

This expedition was fitted out by Sir John Wolstenholme, Sir Dudley Digges, and other persons of distinction, who did not, however, project it on a very magnificent scale. It consisted only of one vessel of 55 tons, provisioned for six months, which left the Thames on the 17th April 1610. Hudson touched at the north of Scotland, the Orkney and Faroe Islands, all which he considered as lying in a lower latitude than the maps represented. On the 11th May he descried the eastern part of Iceland, and was enveloped in a thick fog,—hearing the sea dashing against the coast without seeing it. He was thus obliged to come to anchor; but, as soon as the weather cleared, he proceeded westward along the coast till he reached Snow Hill (Snaefell), which rears its awful head into the inclement sky. On their way the navigators saw Hecla, the volcano of which was then in activity, vomiting torrents of fire down its snowy sides, with smoke ascending to the clouds,—an object not only fearful in itself, but which struck them with alarm, as an indication of unfavourable weather.

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Mount Hecla.

Leaving this coast they now sailed westward, and, after being deceived by several illusory appearances, at length saw the white cliffs of Greenland towering behind a mighty wall of ice. Without attempting to approach the beach, the captain steered towards the south-west, and passed what he imagined to be Frobisher's Straits, which in fact long continued to be erroneously laid down on this shore, though they belong to that of America. He now turned Cape Farewell, and "raised the Desolations," making careful observation of those points of land which he found not well delineated in the charts. The mariners soon began to descry, floating along, the mighty islands of ice,—a sight which appalled all but the stoutest hearts. Onward they advanced, however, sometimes enjoying a clear and open sea, but often encompassed by icebergs or by small and drifting heaps; and at length they had to steer as it were between two lands of ice. On occasions of peril, they not unfrequently moored themselves to the larger masses; but seeing one of them split, and fall with a tremendous crash into the waves, they no longer trusted to such a protection. On the 25th June land appeared to the north, was again lost sight of, and afterwards discovered to the south; so that they found themselves

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at the broad entrance of the channel which has since obtained the name of Hudson's Strait. They were now still more annoyed with ice in various forms, particularly that of large islands standing deep in the water, which were very difficult to avoid from the violent ripples and currents. Thus they were often obliged, especially amid thick fogs, to fasten their vessel to the firmest of these masses; and they even used to land upon them from time to time, collecting the water melted in the hollows, which proved to be sweet and good. Amid these vicissitudes many of the sailors fell sick; and though Pricket does not choose to assert that their sole malady was fear, yet in several he saw no signs of any other. The crews of this period, indeed, display few tokens of that hardihood with which the followers of Willoughby and Frobisher were wont to brave the northern tempests. Hudson seeing his men in this depressed state of mind, bethought himself of an expedient by which he hoped to animate them. He called them together, showed them his chart, from which it appeared that they had penetrated farther into the Straits by a hundred leagues than any former expedition, and put it to themselves whether they would advance,—yea or nay! This was a bold experiment, but did not succeed. Some, it is true, expressed themselves "honestly respecting the good of the action;" but others declared they would give nine-tenths of all they were worth, so that they were safe at home; while a third party said they did not care where they went, so they were out of the ice. Vexed and disappointed, he broke up the conference, and followed his own determination. This, we think, is evidently the real state of the case, though Pricket represents that the captain himself was in a state of alarm and doubt. He accuses him also of having remembered too long some of the speeches made on this occasion, to the disadvantage of those by whom they had been uttered.

Notwithstanding this failure, Hudson, buoyed up by his own courage and resolution, seeing land alternately

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on one side and the other, having sometimes a wide and clear sea, and being occasionally involved amid mountains of ice, made his way onward. Certain savage islands in which, when severely pressed by the wind and floe, he found a tolerable retreat, were called "Isles of God's Mercy;" but even this harbour was rendered dangerous by hidden reefs; and the land adjoining to it contained, according to Pricket, only "plashes of water and riven rocks," and had the appearance of being subject to earthquakes. At length they arrived at a broad opening, having a cape on each side, to which the commander gave the names of the two chief patrons of the voyage; to the one on the continent, that of Wolstenholme; to the other on the large island of Mansfield, that of Sir Dudley Digges. Landing at the latter, and mounting a hill, the men descried some level spots abounding in sorrel and scurvy-grass, plants most salutary in this desert region; while herds of deer were feeding, and the rocks were covered with an unexampled profusion of fowls. Seeing such abundant materials, both for sport and food, the crew, who had ever shown the most anxious concern for their own comfort, earnestly besought their captain to allow them to remain and enjoy themselves for a few days on this agreeable spot; but he, perceiving that the season for his chief enterprise was rapidly passing away, refused to comply. He had not proceeded long in this channel when the coast on each side was observed to separate, and he beheld before him a wide ocean, to which the eye could discover no termination. It seemed to him, doubtless, a portion of the mighty Pacific. Here, however, his narrative closes, without expressing those feelings of pride and exultation which must have filled his mind at this promised fulfilment of his highest hopes. The relation of Pricket, on which we must now depend, shows too clearly that many of his followers would have had no sympathy with such elevated feelings.

The expanse thus discovered by the navigator was the great inland sea, called from him Hudson's Bay;

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and it was a grand discovery, though not exactly what he imagined. The 3d of August was now arrived, a season at which the boldest of northern adventurers had been accustomed to think of returning. But, little inclined to such a resolution, he continued to sail along the coast on the left, which must have appeared to him the western boundary of America,—hoping probably before the close of autumn to reach some cultivated land, in a temperate climate, where he might take up his winter quarters. The shores along this bay, however, though not in a very high latitude, are subject to the rigours of a most inclement sky. Entangled amid the gulfs and capes of an unknown coast, struggling with mist and storm, and ill seconded by a discontented crew, he spent three months without reaching any comfortable haven. It was now the first of November: the ice was closing in on all sides; and nothing remained but to meet the cheerless winter which had actually begun. The sailors were too late of attempting to erect a wooden house; yet the cold, though severe, does not seem to have reached any perilous height. Their chief alarm respected provisions, of which they had brought only a six months' supply, and consequently had now but a small remnant left. Hudson took active measures to relieve this want. He carefully husbanded the original stock, and promised a reward to every one who should kill beast, fish, or bird; and "Providence dealt mercifully," in sending such a number of white partridges, that in three months they secured a hundred dozen. In spring these visiters disappeared, but were succeeded by flocks of geese, swans, ducks, and teal, not natives of that region, but on their flight from south to north. When these were passed, the air no longer yielded food, but the sea began to open, and having on the first day taken five hundred fishes of tolerable size, they conceived good hopes. This success did not continue; and being reduced to great extremity, they searched the woods for moss, which they compare, however, to pounded timber: they ate even frogs. The commander under-

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took an excursion with a view to establish an intercourse with the inhabitants; but they fled, setting fire to the woods behind them. An interview was obtained with one, whom they loaded with gifts; yet he never returned. Discontents arose as to the distribution of the small remaining portion of bread and cheese; to allay which the captain made a general and equal partition of the whole. This was a bad measure as applied to such a description of persons, many of whom knew not how "to govern their share," but greedily devoured it as long as it lasted. One man even ate the whole in a day, and brought on a dangerous surfeit; and their distress, now greater than ever, soon arrived at a most fatal crisis.

Hudson, as may be observed, had from the first to struggle with an unprincipled, ill-tempered crew, void of all concern for the ultimate success of the voyage. He had probably hoped, as the season should advance, to push on southwards, and reach next summer the wealthy regions for which he was commissioned to search. The sailors, on the contrary, had fixed their desires on "the cape where fowls do breed," the only place where they expected to obtain both present supply and the means of returning to England. Ringleaders were not wanting to head this growing party of malecontents. At the entrance of the bay the captain had displaced Ivet the mate for insubordination, and appointed in his room Bylot, a man of merit, who had always shown zeal in the general cause. He had also changed the boatswain. But the most deadly blow was struck by Green, a wretch whom, after being cast off by all his friends, the captain from humanity had taken on board, and endeavoured to reclaim and restore to society. He was possessed of talents which made him useful, and had even rendered him a favourite with his superior; and among other discontents it was reckoned one, that a veil was thrown over several flagrant disorders of which he was accounted guilty. Yet some hot expressions of Hudson, caused, it is said, by a

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misunderstanding about the purchase of a gray coat, so acted on the fierce spirit of this ruffian, that, renouncing every tie of gratitude, and all that is sacred among mankind, he became the chief in a conspiracy to seize the vessel and expose the commander to perish.

After some days' consultation, the time was fixed for the perpetration of this horrible atrocity. On the 21st June 1611, Green, and Wilson the boatswain, came into Pricket's cabin, and announced their cruel resolution,—adding, that they bore him so much good-will as to wish that he should remain on board. The narrator avers most solemnly, that he exhausted every argument to induce them to desist from their horrid purpose, beseeching them not to do a thing so foul in the sight of God and man, and which would for ever banish them from their native country, their wives, and their children. Green wildly answered, that they had made up their minds to go through with it or die, and that they would rather be hanged at home than starve here. An attempt was then made by him to negotiate a delay of three, two, or even one day, but all without effect. Ivet came next, of whom, as being a person of mature age, there seemed more hope; but he was worse than Green, declaring that he would justify in England the deed on which they had resolved. John Thomas and Michael Perse now came in, proving themselves "birds of a feather," and Moter and Bennet having followed, an oath was administered to the following tenor:—"You shall swear truth to God, your prince, and country; you shall do nothing but to the glory of God and the good of the action in hand, and harm to no man." Pricket complains of the reproach thrown upon him for having taken this oath, the bare terms of which are certainly unexceptionable; but the dark proceedings by which they were illustrated marks them as containing an implied obligation to remain at least passive on this dreadful occasion. All was now ready, but the conscientious historian of the voyage succeeded in persuading them to postpone till

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daylight the accomplishment of their crime. They, however, kept strict watch through the night, and held themselves ready to act at the first appearance of dawn.

Daybreak approaching, the captain came out of his cabin, when he was instantly assaulted by Thomas, Bennet, and Wilson, who seized him and bound his hands behind his back; and on his eagerly asking what they meant, told him he should know when he was in the boat. Ivet then attacked King the carpenter, known as the commander's most devoted adherent. That brave fellow, having a sword, made a formidable resistance, and would have killed his assailant, had not the latter been speedily reinforced. The mutineers then offered to him the choice of continuing in the ship; but he absolutely refused to be detained otherwise than by force, and immediately followed his master, whom the conspirators were already letting down the sides of the vessel into the shallop. Then, with a barbarity beyond all example, they called from their beds and drove into it, not simply the friends of Hudson, but the sick and infirm sailors who could afford no aid, and whose maintenance would have been burdensome. They threw after them the carpenter's box, with some powder and shot; and scarcely was this transaction completed, when they cut the boat from the stern, "out with their topsail," and set off, flying as from an enemy. The great navigator, thus abandoned, was never heard of more; and he undoubtedly perished on those desolate shores, though the form or duration of the distress to which he fell a victim must be for ever unknown.

The sailors, as soon as the guilty deed was accomplished, regarding the ship as a captured vessel, broke open every chest, and seized on every remnant of food which could be discovered. Green, however, who now assumed the command, used some vigour in restoring order. He placed the cabin and provisions under the charge of Pricket, who was afterwards accused of a matter no less than treason, that of secreting some cakes of bread. As soon as the mutineers had time to think,

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painful reflections began to arise. Even Green admitted that England at this time was no place for them, nor could he contrive any better scheme than to keep the high sea till, by some means or other, they might procure a pardon under his majesty's hand and seal. The vessel was now embayed, and detained for a fortnight amid fields of ice, which extended for miles around it; and, but for some cockle-grass found on an island, they must have perished by famine. Considerable disputes with respect to the steerage arose between Ivet and Bylot, who alone had any pretensions to skill; but the latter, being justly regarded with the greatest confidence, at length guided them to Cape Digges, the longed-for spot, the breeding-place of fowls, clouds of which accordingly continued still to darken the air. The party immediately landed, spread themselves among the rocks, and began to shoot. While the boat was on shore, they saw seven canoes rowing towards them, whereupon "they prepared themselves for all assayes." However, the savages came forward, beating their breasts, dancing, leaping, and displaying every token of friendship. The utmost intimacy commenced, the parties went back and forward, showed each other their mode of catching fowls, and made mutual presents. In short, the natives appeared the most kind and simple people in the world, and "God so blinded Henry Green" that he trusted them with implicit confidence. One day, when at the height of this affectionate harmony, Pricket, sitting in the boat, suddenly saw a man's leg close to him. Raising up his head, he perceived a savage with a knife uplifted and ready to strike. In attempting to arrest the blow, his hand was cut, and he could not escape two wounds, one in the breast, and one in the right thigh; by which time he got hold of the knife and wrenched it from the assassin, whom he then pierced with his dagger in the left side. At the same time a general attack was made on the crew, dispersed in different quarters. Green and Perse came tumbling down wounded into the boat, which pushed off; while Moter,

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"seeing this medley," leaped into the sea, swam out, and, getting hold of the stern, was pulled in by Perse. Green now cried *coragio*, and he and Perse brandished their weapons with such vigour that the savages ceased attempting to enter the boat; but they poured in clouds of arrows, one of which struck the former with so sure an aim that he died on the spot, and his body was thrown into the sea. At length the party reached the vessel; but Moter and Wilson died that day, and Perse two days after. Thus perished the chief perpetrators of the late dreadful tragedy, visited by Providence with a fate not less terrible than that which they had inflicted on their illustrious and unfortunate leader.

The crew, thus deprived of their best hands, were in extreme perplexity, obliged to ply to and fro across the straits, and unable, without the utmost fear and peril, to venture on shore; which yet was absolutely necessary for obtaining provisions to carry them to England. They contrived, at the expense of much toil and hazard, to collect three hundred birds, which they salted and preserved as the only stock whereupon to attempt the voyage. They suffered, during the passage, the most dreadful extremities of famine, allowing only half a fowl a-day to each man, and considering it a luxury to have them fried with candles, of which a weekly distribution was made for that purpose. Ivet, now the sole survivor of the ringleaders in the atrocious conspiracy, sunk under these privations. The last fowl was in the steep-tub, and the men were become nearly desperate, when suddenly it pleased God to give them sight of land, which proved to be the north of Ireland. They complain that, on going ashore at Berehaven, they did not receive the sympathy and kindness which they so much needed; nor was it until they had mortgaged their vessel that they obtained the means of proceeding to Plymouth.

Purchas closes the narrative by saying,—"Well, Mr Pricket, I am in much doubt of thy fidelity;" and he is not singular in this suspicion. It seems clear, at all

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events, that he did not avail himself of the means by which he might have attempted to check the horrible mutiny. But, on the other hand, it is probable that, had he been an active agent in the crime, some of his accomplices would have betrayed him, or, had their mutual guilt bound them to each other, some story would have been invented to palliate or conceal the offence; whereas it is set forth by his narrative in all its atrocity.

Notwithstanding the calamitous issue of this voyage, the discovery thereby made of a great sea in the west seemed to justify the most flattering hopes of accomplishing a passage. To follow out this object, Captain, afterwards Sir Thomas Button, was despatched next year (1612), having Bylot and Pricket as guides. This officer, who seems to have been active as well as resolute, soon made his way through the Straits, and pushing directly across the sea that opened to the westward, came in view of an insular cape, called by him Carey's Swan's Nest, and which afterwards proved to be the most southern point of Southampton Island. Nothing else broke the apparent continuity of the ocean, and therefore he cherished sanguine hopes that the first shore he should see would be that of Japan. Suddenly an announcement was made that land was in sight, when there appeared before him an immense range of coast, stretching north and south, and barring all farther progress. Button, deeply disappointed, gave to it the name of Hope Checked. Before he had time to look for an opening, the gloom of the northern winter began to gather, when it behoved him to seek quarters for the season; and these he found in the same creek, which afterwards became the principal settlement of the Hudson's Bay Company. In spite of his best precautions, he lost several men through the severity of the cold, and was unable to extricate himself from the ice till the middle of June. He then steered northward, seeking an outlet through the broad bay between the continent and Southampton Island, since called Roe's Welcome.

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Observing, however, that the channel became narrower and narrower, till it apparently closed, he gave up the attempt, and, after touching at several points of the island just named, returned to England.

Although Sir Thomas had been thus baffled by the unwelcome encounter of the western shore of Hudson's Bay, the merchants justly considered it by no means ascertained that the land was so continuous as to preclude all passage into the ocean beyond America; for which reason they resolved to make another attempt, and accordingly, in 1614, they fitted out two vessels under Captain Gibbons, an officer of reputation, pronounced by Button "not short of any man that ever yet he carried to sea." But either his character went beyond his merits, or fortune was singularly adverse, for never was there a more abortive voyage. He was early entangled in a bay on the coast of Labrador, where he was detained the whole summer, and which was afterwards dignified with the appellation of "Gibbons his Hole." Having here sustained some damage from the ice, he no sooner extricated himself than he returned home.

The merchant-adventurers, still undismayed, sent out next summer the Discovery under Bylot, who in all the late voyages had approved himself an able navigator, and was accompanied by Baffin, whose name was now established as the most skilful steersman and best nautical observer of the age. After passing Cape Farewell, they saw some most tremendous islands of ice, one of which rose 240 feet above water, and, according to the usual estimate, which makes this visible part only a seventh of the whole, had probably an entire height of 1680 feet. Having entered the Straits, and, on the 2d June, hearing from the northern shore a furious barking of dogs, they landed and found five tents covered with seal-skin, amongst which were running about thirty or forty of those animals, of a brindled black colour, resembling wolves. They had collars and harness suitable for certain sledges, lined with fish-bone, which were

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standing by. In one of the houses was a bag containing little images of men, the only specimen observed of such fabrication upon this coast. The navigators soon descried a canoe with twenty individuals, whom they hailed in their native language, holding up knives and other toys. Friendly salutations were given in return; but neither party chose to trust themselves within reach of the other. At a little distance, the conflict of opposite currents amid large icebergs caused so fearful a grinding that they gave to the adjoining land the name of Mill Island. There they would have been in extreme danger, "had not God, who is stronger than ice or stream," delivered them.

The policy of Bylot in this voyage seems to have been to keep close to the northern shore of the strait; and thus, entering Hudson's Bay at a higher latitude, he hoped to steer clear of those lands which had barred the westerly progress of his predecessors. Therefore, on reaching the Isles of God's Mercy, instead of holding southward to Cape Dudley Digges, he proceeded directly west, and arrived in the broad expanse afterwards called the Fox Channel. At length, indeed, he saw land, but it was bounded by a cape which had every appearance of being the most northerly point of America. He called it Cape Comfort; though this name, it soon appeared, was prematurely given, for a single day had not elapsed when "his sudden comfort was as soon quailed." They were now on the eastern coast of Southampton Island, which spread on all sides to a very great extent, seeming to preclude every prospect of an opening on either hand. Disappointment, the lateness of the season, and the pressure of the ice, concurred in persuading Bylot that there was nothing to be hoped for here, and determined him to set sail immediately for England; whither he carried a most unfavourable report as to any prospect of penetrating westward in that direction.

But the adventurers were not yet discouraged. Turning their hopes to a different quarter, they next year again fitted out Bylot and Baffin, with instructions no

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longer to attempt the passage by Hudson's Bay, but to enter Davis' Strait, and push due north till they reached lat. 80°, if an open sea should allow them to proceed so far; then, turning to the westward, to round, if practicable, the extreme point of America, and to bear down upon Japan. Respecting this voyage, which, perhaps, of all those to the North, produced the most memorable discoveries, Baffin has favoured us with only a very meagre narrative. Following the course pointed out, he reached, on the 30th May, Hope Sanderson, the farthest point attained by Davis. Soon afterwards the expedition came to a number of small islands, on which they found only females, some of very great age. These at first ran and hid themselves among the rocks; but the sailors having reached two dames, one of whom was estimated at fourscore, and having presented bits of iron and the usual toys, induced them to carry a favourable report to their youthful countrywomen. The whole party soon came down to the shore, and four even went on board the boat. The charms of these ladies were heightened or disfigured by long black streaks made on their faces in early life with a sharp instrument, and so deep that they could not now be effaced. It was observed, too, that the dead were buried merely by piling stones over them, through which the body appeared, secured, however, from putrefaction by the extreme cold of the climate. The navigators sailed onwards in lat. 74°, when they were arrested by a large body of ice, and obliged to turn into a neighbouring inlet to await its melting. Here they received repeated visits from about forty of the natives, the only account of whom is, that they brought an extraordinary quantity of the bones of sea-unicorns, or narwals, great numbers of which animals were seen in the water. Hence this was called Horn Sound. The mass of ice now dissolved before the powerful influence of the sun, and the discoverers sailed northwards among its fragments; but still snow fell every day, and the shrouds and sails were often so hard frozen as to make it impossible to handle them. In 76°

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they came to a fair cape, and then to a goodly sound, to which they gave the respective names of Digges and Wolstenholme, the two main promoters of this undertaking, and whose zeal was already associated with localities in the interior of Hudson's Straits. After having sustained a severe storm, they discovered another inlet, which would have supplied them with a multitude of whales, had they been duly provided with the means of capture: this they called Whale Sound. Next, in 78°, appeared a third, the widest and greatest in all this sea, and which was named for Sir Thomas Smith, one of the chief patrons of discovery. This opening, which Baffin seems to have examined very superficially, abounded almost equally in whales, and caused particular astonishment by the extraordinary aberration of the needle, to which nothing similar had been ever witnessed. Between these two sounds was an island which was denominated Hakluyt, after the venerable recorder of early English discoveries. Proceeding now along the south-western boundary of this great sea, the next "fair sound" received the name of Alderman Jones, another encourager of these laudable pursuits. It may be remarked that Baffin notices all these inlets, of which he was the first discoverer, in the most cursory manner, without mention of any attempt to trace, in their interior depths, an opening into any sea beyond. In lat. 74° there appeared another broad opening, which was called Sir James Lancaster's Sound; but while he calls it great, he seems scarcely to have noticed this future entrance into the Polar Sea; on the contrary, he observes, at the very same moment, that the hope of a passage became every day less and less. He sailed on; but a barrier of ice prevented him from approaching the shore till he came within the "indraft" of Cumberland's Isles, "where hope of passage could be none." Finding the health of his crew rather declining, he sailed across to Greenland, where an abundance of scurvy-grass boiled in beer quickly restored them; and "the Lord then sent a speedy and good passage homeward."

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On returning, he expressed the most decided conviction that the great sea which he had traversed was enclosed on all sides, and afforded no opening into any ocean to the westward; and his judgment was received by the public, who named it from him Baffin's Bay. He forcibly, however, represented the great encouragement it held out to the whale-fishery, as those huge animals were seen sleeping in vast numbers on the surface of the water, without fear of the ship "or of any thing else." Davis' Strait, accordingly, has ever since been a favourite resort of the fishers, who did not, however, till lately venture into those high latitudes, where whales are described as more peculiarly abundant.

There was now a pause in English discovery; every quarter had been tried, and none seemed to afford any farther promise; nor was it till 1619 that Denmark, which has always felt an interest in northern navigation, made an attempt to follow up the success of Hudson and Baffin. At the period just named, Christian IV. sent out two well-appointed vessels under Jens Munk, who had the reputation of a good seaman. He succeeded in penetrating through Hudson's Straits into the bay, whereupon he took upon himself to change the whole nomenclature of that region, imposing the names of Christian's Straits and Christian's Sea, and calling the western coast New Denmark. But this innovation, which was contrary to every principle recognised in such cases, has not been confirmed by posterity. When September arrived, and the ice closed in, he thought it prudent to seek winter-quarters, and accordingly established himself in the mouth of an opening which, it is highly probable, was that channel which has since been called Chesterfield Inlet. The season seemed to open with the best promise, commodious huts were constructed, and there were both abundance and variety of game. His people witnessed some of those brilliant phenomena that are peculiar to high latitudes; at one time were two and at another three suns in the sky; and the moon was once environed by a transparent circle, within

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which was a cross cutting through its centre. But, instead of amusing their minds and improving science by noting these beautiful appearances, they were depressed by viewing them as a mysterious presage or future evils. Frost now set in with all its intensity; their beer, wine, and other liquors, were converted into ice; the scurvy began its ravages; while they, ignorant of the mode of treating it, employed no remedy except a large quantity of spirits, which has always been found to aggravate that frightful disorder. Unfit for the exertion necessary to secure the game with which the country abounded, they soon had famine added to their other distresses; and their miseries seem to have been almost without a parallel, even in the dark annals of northern navigation. Munk himself was left four days in his hut without food; at length, having crawled out, he found that of the original crew of fifty-two no more than two survived. He and they were overjoyed to meet, and determined to make an effort to preserve life. Gathering strength from despair, they dug into the snow, under which they found herbs and grass, which, being of an antiscorbutic quality, soon produced a degree of amendment. Being then able to fish and shoot, they gradually regained their natural vigour. They equipped anew the smaller of the two vessels, in which they reached home on the 25th September 1620, after a stormy and perilous voyage. The commander declared his readiness to sail again; and there are various reports as to the cause why he did not. Some say, that having in a conference with the king been stung by some expressions which seemed to impute the disasters of the late enterprise to his mismanagement, he died of a broken heart. But Forster relates that, during several successive years, he was employed by his majesty on the North Sea and in the Elbe, and that he died in 1628, when engaged in a naval expedition.

The English, after Baffin's attempt, appearing to relinquish every prospect of discovery in the more northern seas, confined for a long time all their efforts in the

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direction of Hudson's Bay. But as these did not lead to any important results, and are chiefly connected with the remoter settlements of America, we shall introduce here only a very slight sketch of them.

Captains Fox and James were fitted out in 1631. The former examined two passages leading to the northward, one on the western side of Southampton Island, called Sir Thomas Roe's Welcome; the other on the eastern side, called from himself Fox's Channel; but he did not trace either to any great height. James, entangled in the southern extremity of Hudson's Bay, spent a winter under the most extreme suffering from cold, and returned next summer to England.

About 1668 a settlement was formed in the bay just specified, and an extensive company established for the traffic in furs; but this association, though bound by their charter to make the most strenuous exertions for the discovery of a western passage, concerned themselves very little with the subject till 1719, when they were in a manner compelled to fit out an expedition under Knight and Barlow. These officers, however, never returned, and a vessel sent next season under Captain Scroggs could learn no tidings of them; nor was it till nearly fifty years afterwards that the wrecks of their armament were found on Marble Island, where they appear to have been cast ashore and lost.

In 1741, after a long interval, Captain Middleton, supported by a gentleman of the name of Dobbs, obtained the command of two vessels, with which he sailed up the Welcome. He came to a long inlet called the Wager, but it appeared quite enclosed by a shore, with a river falling into it. Proceeding to its northern extremity, he found a spacious opening, that afforded at first the greatest hopes; but being disappointed by the appearance of land, he named it Repulse Bay. The coast then taking an easterly direction, he followed it till he came to a channel which, from the accumulation of ice at its entrance, he called the Frozen Strait. A current ran through it, which, however, appeared to him to be

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merely the one that had entered by Hudson's Strait, and proceeded circuitously round Southampton Island. He returned home, expressing a decided conviction that no practicable passage existed in that direction.

Mr Dobbs, the mover of the expedition, was deeply disappointed by this result; and from his own reflections, and the statement of several of the inferior officers, became convinced that Middleton had given a very incorrect statement of the facts. Of this he so fully convinced both the Parliament and the nation, that £10,000 was subscribed for a new expedition, and a reward of £20,000 promised to the discoverers of the projected passage. Captains Moor and Smith, in 1746, commanded this armament, which, like most of those equipped with great pomp and circumstance, entirely failed. They merely ascertained, what was pretty well known before, that the Wager afforded no outlet; and, after spending a severe winter there, returned next season to England.

It appears, by notices which Mr Barrow has drawn from the Admiralty records, that the armed brig Lion was sent in 1776, under Lieutenant Pickersgill, and in 1777, under Lieutenant Young, with the view of acting in concert with Captain Cook, who in his third voyage might, it was hoped, make his way round from Behring's Strait into the Atlantic. These officers reached respectively the latitudes of 68° and 72°, without effecting or almost attempting any thing farther.

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CHAPTER VII.

Voyages by Ross and Parry in Search of a North-west Passage.

Spirited Views of the British Government—Ross's Expedition; He sails round Baffin's Bay; Arctic Highlands; Lancaster Sound; His Return—Parry's First Expedition; Entrance into the Artic Sea; Regent's Inlet; North Georgian Islands; Winters at Melville Island; Mode of spending the Winter; North Georgian Theatre; Gazette; Disappearance of the Animal Tribes; Attempt to proceed Westward during the Summer; His Return to England—Parry's Second Expedition, accompanied by Captain Lyon; He enters Hudson's Strait; Savage Islands; Duke of York's Bay; Frozen Strait; Various Inlets discovered; Ships frozen in for the Winter; Polar Theatre and School; Brilliant Appearances of the Aurora Borealis; Intercourse with a Party of Esquimaux; Land Excursions; Release from the Ice; Voyage Northward; Discovery of a Strait named after the Fury and Hecla; Progress arrested; Second Winter-quarters, at Igloolik; The Esquimaux; Symptoms of Scurvy; Return of the Expedition to England—Parry's Third Expedition; He winters at Port Bowen; Shipwreck of the Fury; Return of the Hecla.

BRITAIN had seen other nations carry off all the great prizes in naval discovery. She had scarcely a vessel on the ocean, when the nations of the Iberian peninsula laid open new worlds, and appropriated the golden treasures of the East and of the West. But her energies being once roused, her efforts were from the beginning bold and adventurous, though sometimes made with inadequate means, on a small scale, and often with a

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disastrous issue. Advancing, however, with regular steps, she first rivalled and finally surpassed all other modern states. The reigns of George III. and of his eldest son formed the era which decided both her maritime supremacy and her special eminence in the department of discovery. She achieved almost entirely the exploration of the vast expanse of the South Sea, with its great and numerous islands, leaving to the exertions of France only a scanty gleaning. The revolutionary war, indeed, for some time employed the attention and resources of the nation; but as soon as her signal triumphs had left Britain without an enemy in the seas of Europe, she looked again to this theatre of her former glory. Even amid the din of arms, the African Association pursued their enlightened and philanthropic course; and the important results to which they attained finally induced the government to take an interest in their undertaking, and to aid them with means which no private body could command. Mr Barrow, who by his personal exertions had illustrated some of the most interesting portions of the globe, took the chief direction,—prompting and guiding every step with an energetic perseverance and practical judgment never before extended in an equal degree to similar objects. The measures pursued with respect to Africa do not come within the compass of the present work; but when the spirit was once roused, it did not confine itself to a single point. The northern seas, as a theatre of adventure, had been unoccupied for half a century. There prevailed, indeed, a general impression that so many fruitless expeditions had set the question at rest; but when Mr Barrow applied to it the powers of his vigorous and penetrating judgment, he became sensible that this conclusion was quite groundless. Baffin had once sailed round that great sea, which by him was called a bay, and still bears his name; but his examination had been quite superficial, and insufficient to establish that continuity of land with which the maps had so thoroughly enclosed it. There were even striking facts indicating

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that there must be a communication with the Greenland Sea on the one side, and the Pacific Ocean on the other. Even in regard to Hudson's Bay, no progress was made since Parliament had offered a reward of £20,000, and sent out the large expedition under Captains Moor and Smith. Thus the grand problem in which the country had long taken so deep an interest was still unsolved; and to decide it nothing more seemed necessary than the application of that skill and undaunted courage, of which British seamen have shown themselves so eminently possessed.

In 1818 the Admiralty fitted out two expeditions; one destined for the discovery of the north-west passage, the other to attempt a voyage across the Pole. The first, which is the one we are at present to follow, consisted of the Isabella of 385 tons, commanded by Captain John Ross, an officer of reputation and experience, who had twice wintered in the Baltic, had been employed in surveying the White Sea, and been as far north as Bear or Cherie Island. Another vessel, the Alexander of 252 tons, was intrusted to Lieutenant Parry, a young officer of rising merit, who has since amply justified the choice made by his employers.

On the 18th April the navigators sailed down the Thames, and by the end of the month were off the Shetland Islands. On the 27th May they came in view of Cape Farewell; round which, as usual, were floating numerous and lofty icebergs of the most varied forms and tints. On the 14th June they reached the Whale Islands, where they were informed by the governor of the Danish settlement that the past winter had been uncommonly severe; that the neighbouring bays and straits had been all frozen two months earlier than usual; and that some of the channels northward of his station were still inaccessible, owing to the ice. A curious assertion was here made by the Esquimaux, that they could see across the whole breadth of the bay, though not less than two hundred miles, which, indeed, would be an extraordinary instance of the power of re-

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fraction; but it ought to be observed, that the frozen surface of the sea often presents deceptive appearances of land. On the 17th June, in the neighbourhood of Waygat Island, an impenetrable barrier obliged the discoverers to stop their course, making themselves fast to an iceberg, and having forty-five whale-ships in company. Observations made ashore proved this island to be misplaced on the maps by no less than five degrees of longitude. At length the ice attached to the eastern side of the strait broke up, though still forming a continuous and impenetrable rampart at some distance to the westward, in which direction it had drifted; but in the intermediate space they were enabled to move forward slowly along the coast, labouring through narrow and intricate channels. They steered their course, however, to the higher parts of the bay, and in about lat. 75° came to a coast which had not been visited by former navigators. They were struck, as Baffin had been, by the great number of whales which were slumbering securely in these deep recesses, never having been alarmed by the harpoon. On the 7th August, in the same latitude, a heavy gale sprung up, which, driving the ice against the vessels, made a display of its terrible power. Providentially, when instant destruction was expected, the mass receded, and the ships, owing to the extraordinary strength of their construction, escaped without material injury.

Proceeding along a high mountainous coast, the expedition came to a tribe of Esquimaux, who, of all human beings, seem to exist in a state of the deepest seclusion. They had never before seen men belonging to the civilized world, or to a race different from their own. The first party whom the navigators approached showed every sign of alarm,—dreading, as was afterwards understood, a fatal influence from the mere touch of beings whom they regarded as members of an unknown species. Yet they seem to have felt a secret attraction towards the strangers, and advanced, holding fast the long knives lodged in their boots, and looking

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significantly at each other. Having come to a chasm which separated them from the strangers, they made earnest signs that only Saccheous, the interpreter,* who bore a certain resemblance to themselves, should come across. He went forward and offered his hand; but they shrunk back for some time in alarm. At length the boldest touched it, and finding it flesh and blood, set up a loud shout, in which three others joined. The rest of the party then came up, to the number of eight, with fifty dogs, which joined their masters in raising a tremendous clamour. Ross and Parry now thought it time to advance. This movement excited alarm and a tendency to retreat; but Saccheous having taught these officers to pull their noses, this sign of amity was graciously accepted. A mirror was now held up to them, and on seeing their faces in it they showed the most extreme astonishment, looking round on each other a few moments in silence, then setting up a general shout, succeeded by a loud laugh of delight and surprise. The ship was the next object of their speculation; the nature of which they endeavoured to ascertain by interrogating itself; for they conceived it to be a huge bird spreading its vast wings, and endowed with reason. One of them, pulling his nose with the utmost solemnity, began thus to address it:—"Who are you? Whence come you?

* This young man was a native of Greenland, who had accompanied the Thomas and Anne, Captain Newton, one of the Leith whalers, on her homeward voyage in 1816; and the following year he went out to the fishery, returning a second time to Europe. During this period, being intelligent and docile, he made considerable proficiency in a course of elementary study, in the prosecution of which he received every assistance from his friends in Leith. On the equipment of the Arctic expedition, his wishes to accompany the discovery-ships having been communicated to government through the medium of Captain Basil Hall, he was immediately engaged as interpreter. His services in that capacity, as the narrative shows, were of eminent utility; and, on his return, the Admiralty, desirous to have him properly instructed, in the event of a future expedition, sent him to Edinburgh for that purpose. Here, however, in the ensuing spring, he was unfortunately attacked with an inflammatory fever, which carried him off in a few days.

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Is it from the sun or the moon?" The ship remaining silent, they at length applied to the interpreter, who assured them that it was a frame of timber, the work of human art. To them, however, who had never seen any wood but slight twigs and stunted heath, its immense planks and masts were objects of amazement. What animal, they also asked, could furnish those enormous *skins* which were spread for the sails. Their admiration was soon followed by a desire to possess some of the objects which met their eyes, and with little ceremony or discrimination as to the means of effecting their end. They attempted first a spare topmast, then an anchor; and these proving too ponderous, one of them tried the smith's anvil; but, finding it fixed, made off at last with the large hammer. It was not less wonderful in their eyes to see the sailors mounting the rigging; nor was it without much hesitation that they ventured their own feet in the shrouds. A little terrier-dog appeared to them a contemptible creature, wholly unfit for drawing burdens or being yoked in a sledge, while the grunt of a hog filled them with alarm.

This tribe, in features, form, and even language, belong evidently to the Esquimaux,—a race widely diffused over all the shores of the Arctic Ocean. They appear to have little or no communication with the rest, and amid the general resemblance have some distinguishing characters. The boat, large or small, which we almost instinctively associate with our idea of the Greenlander, is here wholly unknown. Much of their food is found in the deep, and procured at various parts of the icy surface which incrusts it during the greater part of the year. Yet they have one important advantage, not only over other Esquimaux, but over the most civilized of the native Americans. Their country affords iron, which, being flattened by sharp stones, and inserted in a handle made of the horn of the sea-unicorn, forms knives much more efficient than those framed of bone by the neighbouring hordes. Again, unlike the other tribes, they have a king, who rules seemingly with

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gentle sway; for they described him as strong, very good, and very much beloved. The discoverers did not visit the court of this Arctic potentate; but they understood that he draws a tribute, consisting of train-oil, seal-skins, and the bone of the sea-unicorn. Following the general usage, they have sledges drawn by large and powerful teams of dogs; their chase is chiefly confined to hares, foxes of various colours, the seal, and the narwal. They rejected with horror the proffered luxuries of biscuit, sweetmeats, or spirits; train-oil, as it streamed from various species of fish, alone gratified their palate. Captain Ross, swayed by national impressions, gave to this district the name of the *Arctic Highlands*.

In the northern part of this coast the navigators observed a remarkable phenomenon,—a range of cliffs, the snowy covering of which had exchanged its native white for a tint of deep crimson. This red snow was not only examined on the spot, but a portion of it was brought to England, and analyzed by the most learned men both at home and abroad, who have entertained various opinions as to the origin of the colour. The latest observations, as elsewhere observed, have established its vegetable origin.*

Having now passed Cape Dudley Digges, the commodore found himself among those spacious sounds which Baffin had named, but so imperfectly described. They all appeared to him, however, to be either bays enclosed by land or obstructed by impenetrable barriers of ice. He sailed past Wolstenholme and Whale Sounds very quickly, without approaching even their entrance; concluding them to be blocked up with ice, and to afford no hope of a passage. As these openings stretched towards the north, it must be admitted that they could not in this high latitude be considered very favourable as to the object he had in view. He came next to Sir Thomas Smith's Sound, which, we may recollect, Baffin described as the most spacious in the whole circuit of

* See chap. i. p. 22, note; chap ii. p. 91-94.

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these coasts. This was regarded with greater attention; but Captain Ross satisfied himself that he had distinctly seen it, at the distance of eighteen leagues, completely enclosed by land. He soon arrived at an extensive bay, which had hitherto been unobserved,—afterwards to that which Baffin called Alderman Jones' Sound; but in respect to both, the ice at their entrance, and the apparent boundary of high land in the interior, led, as in the other instances, to an unfavourable conclusion.

The season was now somewhat advanced; the end of August approached; the sun set after an uninterrupted day of two months and a half; and a thick fog rendered the lengthening nights more gloomy. The land, seen at some distance, consisted of very high and steep hills, presenting, however, some spots fit for human habitation. An opening forty-five miles wide, to the southward of a promontory which was named Cape Charlotte, was decided against on the usual grounds. On the 30th August, the expedition came to a most magnificent inlet, bordered by lofty mountains of peculiar grandeur, while the water, being clear and free from ice, presented so tempting an appearance, that it was impossible to refrain from entering. This channel, which soon proved to be Lancaster Sound, was ascended for thirty miles; during which run officers and men crowded the topmast, filled with enthusiastic hope, and judging that it afforded a much fairer prospect of success than any of those so hastily passed. Captain Ross, however, soon thought that he discovered a high ridge stretching directly across the inlet; and, though a great part of it was deeply involved in mist, a passage in this direction was by him judged to be hopeless. The sea being open, however, the commander proceeded; but about twelve o'clock Mr Beverley, the assistant-surgeon, came down from the crow's nest, and stated, that he had seen the land extending very nearly across the entire bay. Hereupon, it is said, all hopes were renounced, even by the most sanguine, and Captain Ross sailed onward merely for the purpose of making some magnetical observations.

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At three o'clock, the sky having cleared, the commander himself went on deck, when he states that he distinctly saw across the bottom of the bay a chain of mountains, continuous and connected with those which formed its opposite shores. The weather then becoming unsettled, he made the signal to steer the vessels out of Lancaster Sound.

On regaining the entrance of this great channel, Captain Ross continued to steer southward along the western shore, without seeing any entrance which afforded equal promise. Cumberland Strait alone was similar in magnitude; but as it could lead only into the higher latitudes of Hudson's Bay, it afforded little chance of a passage into the Arctic Sea. After surveying, therefore, some of these shores, he returned home early in October.

The captain arrived in England under the most decided conviction that Baffin's observations had been perfectly correct, and that Lancaster Sound was a bay, affording no entrance into any western sea. If even any strait existed between the mountains, it must, he conceived, be for ever innavigable, on account of the ice with which it is filled. The intelligent individuals, however, who had fitted out the ships with such zeal and on so great a scale, felt dissatisfaction at this conclusion, as connected at least with the premises from which it was drawn. The grounds, in particular, on which Lancaster Sound, an opening so spacious, and in a position so favourable in respect to western discovery, had been so abruptly quitted, appeared inadmissible. The same opinion was very decidedly espoused by several of the officers, and especially by Lieutenant Parry, the second in command. It was determined, in short, that a fresh expedition should be equipped and intrusted to him, that he might fulfil, if possible, his own sanguine hopes and those of the government. He was furnished with the Hecla of 375 tons, and a crew of fifty-eight men; and with the Griper gun-brig of 180 tons, and thirty-six men, commanded by Lieutenant Liddon.

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These ships were made as strong as possible for the navigation of the Arctic Seas; and were stored with ample provisions for two years, a copious supply of antiscorbutics, and every thing which could enable the crews to endure the most extreme rigours of a Polar winter.

Lieutenant Parry, destined to outstrip all his predecessors in the career of northern discovery, weighed anchor at the Nore on the 11th May 1819, and on the 20th rounded the remotest point of the Orkneys. He endeavoured to cross the Atlantic about the parallel of 58°, and though impeded during the first fortnight of June by a series of unfavourable weather, obtained on the 15th, from the distance apparently of not less than forty leagues, a view of the lofty cliffs composing Cape Farewell. On the 18th the ships first fell in with icebergs, the air being also filled with petrels, kittiwakes, terns, and other winged inhabitants of the northern sky. He now made an effort to push north and west, through the icy masses, in the direction of Lancaster Sound; but these suddenly closed upon him; and on the 25th both vessels were so immovably beset that no power could turn their heads a single point of the compass. They remained thus fixed, but safe, when, on the morning of the second day, a heavy roll of the sea loosened the ice, and drove it against them with such violence, that only their very strong construction saved them from severe injury. The discoverers therefore were fain to extricate themselves as soon as possible; and, resigning the idea of reaching Lancaster Sound by the most direct course, resolved to steer northward along the border of this great icy field till they should find open water. In this progress they verified the observation of Davis, that in the narrowest part of the great sea, misnamed his Strait, the shores on each side could be seen at the same moment. Thus they proceeded till they reached the Women's Islands and Hope Sanderson, in about latitude 73°. As every step was now likely to carry them farther from their destination,

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Parry determined upon a desperate push to the westward. Favoured with a moderate breeze, the ships were run into the detached pieces and floes of ice, through which they were heaved with hawsers; but the obstacles becoming always more insuperable, they were at length completely beset, and a heavy fog coming on made them little able to take advantage of any favourable change. Yet in the course of a week, though repeatedly and sometimes dangerously surrounded, they warped their way from lane to lane of open water, till only one lengthened floe separated them from an open sea. By laboriously sawing through this obstruction, they finally penetrated the great barrier, and saw the shore, clear of ice, extending before them.

The navigators now bore directly for Lancaster Sound, and on the 30th July found themselves at its entrance. They felt an extraordinary emotion as they recognised this magnificent channel, with the lofty cliffs by which it was guarded, aware that a very short time would decide the fate of their grand undertaking. They were tantalized, however, by a fresh breeze coming directly down the Sound, which did not suffer them to make more than a very slow progress. Still there was no appearance of obstruction, either from ice or land, and even the heavy swell which they had to encounter, driving the water repeatedly in at the stern-windows, was hailed as an indication of open sea to the westward. The Hecla left the Griper behind, but still without making any great way herself, till the 3d August, when an easterly breeze sprung up, carrying both vessels rapidly forward. A crowd of sail was set, and they proceeded triumphantly in their course. The minds of all were filled with anxious hope and suspense. The mast-heads were crowded with officers and men, and the successive reports brought down from the highest pinnacle, called the crow's nest, were eagerly listened to on deck. Their path was still unobstructed. They passed various headlands, with several wide openings towards the north and south, to

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which they hastily gave the names of Croker Bay, Navy Board Inlet, and similar designations; but those it was not their present object to explore. The wind, freshening more and more, carried them happily forward, till at midnight they found themselves in longitude 83° 12′, nearly a hundred and fifty miles from the mouth of the sound, which still retained a breadth of fifty miles. The success of the expedition, they fondly hoped, was now to a great extent decided.

The Hecla at this time slackened her course to allow her companion to come up, which she did in longitude 85°. They proceeded together to longitude 86° 30′, and found two other inlets, which they named Burnet and Stratton; then a bold cape named Fellfoot, forming, apparently, the termination of this long line of coast. The lengthened swell which still rolled in from the north and west, with the oceanic colour of the waters, inspired the flattering persuasion that they had already passed the region of straits and inlets, and were now wafted along the wide expanse of the Polar Basin. Nothing, in short, it was hoped, would henceforth obstruct their progress to Icy Cape, the western boundary of America. An alarm of land was given, but it proved to arise only from an island of no great extent. However, more land was soon discovered beyond Cape Fellfoot, which was ascertained to be the entrance to a noble recess, extending on their right, which they named Maxwell Bay. An uninterrupted range of sea still stretched out before them, though they were somewhat discomposed by seeing on the south a line of continuous ice; but it left an open passage, and they hoped to find it merely a detached stream. A little space onwards, however, they discovered, with deep dismay, that this ice was joined to a compact and impenetrable body of floes, which completely crossed the channel, and joined the western point of Maxwell Bay. It behoved them, therefore, immediately to draw back, to avoid being embayed in the ice, along the edges of which a violent surf was then beating. The officers

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began to amuse themselves with fruitless attempts to catch white whales, when the weather cleared, and they saw to the south an open sea with a dark water-sky. Parry, hoping that this might lead to an unencumbered passage in a lower latitude, steered in this direction, and found himself at the mouth of a great inlet, ten leagues broad, with no visible termination; and to the two capes at its entrance he gave the names of Clarence and Seppings.

The mariners, finding the western shore of this inlet greatly obstructed with ice, moved across to the eastern, where they entered a broad and open channel. The coast was the most dreary and desolate they had ever beheld even in the Arctic world, presenting scarcely a semblance either of animal or vegetable life. Navigation was rendered more arduous from the entire irregularity of the compass, now evidently approaching to the magnetic pole, and showing an excess of variation which they vainly attempted to measure, so that the binnacles were laid aside as useless lumber. They sailed a hundred and twenty miles up this inlet, and its augmenting width inspired them with corresponding hopes; when, with extreme consternation, they suddenly perceived the ice to diverge from its parallel course, running close in with a point of land which appeared to form the southern extremity of the eastern shore. To this foreland they gave the name of Cape Kater. The western horizon also appeared covered with heavy and extensive floes, a bright and dazzling iceblink extending from right to left. The name of the Prince Regent was given to this spacious inlet, which Parry strongly suspected must have a communication with Hudson's Bay. He now determined to return to the old station, and watch the opportunity when the relenting ice would allow the ships to proceed westward. That point was reached, not without some difficulty, amid ice and fog. At Prince Leopold's Islands, on the 15th, the barrier was as impenetrable as ever, with a bright blink; and from the top of a high hill there was no water to be

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seen; luckily also there was no land. On the 18th, on getting once more close to the northern shore, the navigators began to make a little way, and some showers of rain and snow, accompanied with heavy wind, produced such an effect, that on the 21st the whole ice had disappeared, and they could scarcely believe it to be the same sea which had just before been covered with floes upon floes as far as the eye could reach.

Mr Parry now crowded all sail to the westward, and, though detained by want of wind, he passed Radstock Bay, Capes Hurd and Hotham, and Beechey Island; after which he discovered a fine and broad inlet leading to the north, which he called Wellington, the greatest name of the age. The sea at the mouth being perfectly open, he would not have hesitated to ascend it, had there not been before him, along the southern side of an island named Cornwallis, an open channel leading due west. Wellington Inlet was now considered by the officers, so high were their hopes, as forming the western boundary of the land stretching from Baffin's Bay to the Polar Sea, into which they had little doubt they were entering. For this reason Lieutenant Parry did not hesitate to give to the great channel, which was understood to effect so desirable a junction, the merited appellation of Barrow's Strait, after the much-esteemed promoter of the expedition. A favourable breeze now sprung up, and the adventurers passed gaily and triumphantly along the extensive shore of Cornwallis Island, then coasted a larger island named Bathurst, and next a smaller one called Byam Martin. At this last place they judged by some experiments that they had passed the magnetic meridian, situated probably in about 100 degrees west longitude, and where the compass would have pointed due south instead of due north. The navigation now became extremely difficult, in consequence of thick fogs, which not only froze on the shrouds, but, as the compass was also useless, took away all means of knowing the direction in which they sailed. They were obliged to trust that the land and

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ice would preserve the same line, and sometimes employed the oddest expedients for ascertaining the precise point. They encountered also a compact floe, through which they were obliged to bore their way by main force. Notwithstanding all these obstacles they reached the coast of an island larger than any before discovered, to which they gave the name of Melville. The wind now failed, and they moved slowly forward by towing and warping, till on the 4th September the lieutenant could announce to his joyful crew, that, having reached the longitude of 110° W., they were become entitled to the reward of £5000, promised by Parliament to the first ship's company who should attain that meridian. They still pushed forward with redoubled ardour, but soon found their course arrested by an impenetrable barrier of ice. They waited nearly a fortnight in hopes of overcoming it; till, about the 20th, their situation became alarming. The young ice began rapidly to form on the surface of the waters, retarded only by winds and swells; so that the commanding officer was convinced that, in the event of a single hour's calm, he would be frozen up in the midst of the sea. No option was therefore left but to return, and to choose between two apparently good harbours, which had been recently passed on Melville Island. Not without difficulty he reached this place on the 24th, and decided in favour of the more western haven, as affording the fullest security; but it was necessary to cut his way two miles through a large floe with which it was encumbered. To effect this arduous operation, the seamen marked with boarding-pikes two parallel lines, at the distance of somewhat more than the breadth of the larger ship. They sawed, in the first place, along the path tracked out, and then by cross-sawings detached large pieces, which were separated diagonally in order to be floated out; and sometimes boat-sails were fastened to them to take the advantage of a favourable breeze. On the 26th the ships were established in five fathoms water, at about a cable's length from the beach.

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For some time the ice was daily cleared round them; but this was soon found an endless and useless labour, and they were allowed to be regularly frozen in for the winter.

Mr Parry then applied himself to name the varied group of islands along which he had passed. He called them at first New Georgia; but, recollecting that this appellation was pre-occupied by one in the Pacific, he gave the title of "the North Georgian Islands," in honour of his Majesty George III., whose reign had been so eminently distinguished by the extension of nautical and geographical knowledge.

The commander, finding himself and his ships shut in for a long and dreary winter, devoted his attention, with a mixture of firmness and kindness, to mitigate those evils which, even in lower latitudes, had often rendered an abode in the Arctic regions so fatal. His provisions being very ample, he substituted for a pound of salt beef weekly a pound of Donkin's preserved meat, and a pint of concentrated soup; beer and wine were regularly served instead of spirits; and a certain allowance was made of sour-krout, pickles, and vinegar. The sailors were also called together daily, and required to swallow a quantity of lime-juice and sugar in presence of the officers, their improvidence being such as to afford no other security for their imbibing this salutary draught. Their gums and shins were also carefully examined, in order to detect scurvy in its earliest symptoms. It was necessary to be very economical of fuel, the small quantity of moss and turf which could be collected being too wet to be of any use. By placing the apparatus for baking in a central position, and by several other arrangements, the cabin was maintained in a very comfortable temperature; but still, around its extremities and in the bed-places, steam, vapour, and even the breath, settled, first as moisture and then as ice. To remove these annoyances became accordingly a part of their daily employment.

From the first, Mr Parry was aware that nothing acted

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more strongly as an antiscorbutic, than to keep the men's minds in a lively and cheerful state. His plans for this purpose were very original, and proved not less effectual. Arrangements were made for the occasional performance of a play, in circumstances certainly very remote from any to which the drama appeared congenial. Lieutenant Beechey was nominated stage-manager, and the other gentlemen came forward as amateur performers. The very expectation thus raised among the sailors, and the bustle of preparing a room for the purpose, were extremely beneficial; and when the North Georgian Theatre opened with "Miss in her Teens," these hardy tars were convulsed with laughter; not a little excited, perhaps, by viewing their officers in so singular and novel a position; at all events, the Arctic management was extremely popular. As the small stock contained in one or two chance volumes was exhausted, original compositions were produced, and afterwards formed into a little collection. The officers had another source of amusement in the North Georgian Gazette, of which Captain Sabine became editor, and all were invited to contribute to this chronicle of the frozen regions. Even those who hesitated to appear as writers, enlivened the circle by severe but good-humoured criticisms :—

> Thus pass'd the time
> Till, through the lucid chambers of the south,
> Look'd out the joyous *Sun*.

It was on the 4th November that this great orb ought to have taken his leave; but a deep haze prevented them from bidding a formal farewell, and from ascertaining the period down to which refraction would have rendered him visible; yet he was reported to be seen from the mast-head on the 11th. Amid various occupations and amusements, the shortest day came on almost unexpected, and the seamen then watched with pleasure the twilight gradually strengthening at noon. On the 28th January none of the fixed stars could be seen at that hour by the naked eye; and on the 1st and 2d of February the sun was looked for, but the sky was wrapped

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in mist; however, on the 3d he was perceived from the maintop of the Hecla. Throughout the winter, the officers, at the period of twilight, had taken a regular walk of two or three hours; not proceeding, however, farther than a mile, lest they should be overtaken by snow-drift. There was a want of objects to diversify this promenade. A monotonous surface of dazzling white covered land and sea; the view of the ships, the smoke ascending from them, the sound of human voices, which through the calm and cold air was carried to an extraordinary distance, alone gave any animation to this wintry scene. The officers, however, persevered in their daily excursion, and exercise was also enforced upon the men, who, even when prevented by the weather from leaving the vessel, were made to run round the deck, keeping time to the tune of an organ. This movement they did not at first entirely relish; but, no plea against it being admitted, they converted it at last into matter of frolic.

By the above means health was maintained on board the ships to a surprising degree. Early in January, however, Mr Scallon, the gunner, felt symptoms, first in the legs and then in the gums, that decidedly indicated the presence of scurvy, of which the immediate cause appeared to be the great collection of damp that had formed around his bed-place. At this alarm, all the antiscorbutics on board, lemon-juice, pickles, and spruce-beer, were put into requisition; a small quantity of mustard and cress was also raised from mould placed over the stove-pipe; and such was the success of these remedies, that in nine days the patient could walk without pain. Farther on in the season a number of slighter cases occurred, which were somewhat aggravated by an accident. As the men were taking their musical perambulation round the deck, a house erected on shore, and containing some of the most valuable instruments, was seen to be on fire. The crew instantly ran, pulled off the roof with ropes, knocked down a part of the sides, and being thus enabled to throw in large quantities

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of snow, succeeded in subduing the flames. Now, however, their faces presented a curious spectacle, every nose and cheek being white with frost-bites, while the medical gentlemen, with their assistants, were obliged to run from one to the other, and rub them with snow in order to restore animation. With one man the amputation of several fingers became necessary, and no less than sixteen were added to the sick-list.

The animal tribes disappeared early in the winter from this frozen region. The officers, on the 15th October, made a shooting-excursion, enjoying a very fine day, though with the thermometer 47° below the freezing-point; but they did not find a deer, a grouse, nor any creature that could be ranked as game. All of them, deserting this wintry realm, had crossed the seas to America. There remained only a pack of wolves, which serenaded the crews nightly, not venturing to attack, but contriving to avoid being captured. A beautiful white fox was caught and made a pet of. On the 12th May one of the men gave notice that he had seen a ptarmigan; and attention being thus excited, Mr Beverley next morning shot one, and on the 15th three coveys presented themselves. The footsteps of deer were also seen, which, from the impression made on the snow, seemed to be moving northwards. From this time ptarmigans were supplied in considerable numbers; but they were made strictly a common good, being divided equally among the crew, with only a preference in favour of the sick. There was found, also, mixed with moss under the snow, an abundance of the herb sorrel, a most potent antidote against scurvy. By these supplies, and under the influence of the more genial weather, the health of the crew, which at the end of March had been in a somewhat alarming state, was completely restored before the beginning of June. In extending their excursions, however, they were considerably incommoded by that distressing inflammation of the eyes, which, proceeding from the glare of snow, is called snow-blindness. It was cured in a few days by cold applications,

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while, for the future, it was prevented by covering the eyes, or by wearing spectacles, in which crape was used instead of glass.

On the 16th March the North Georgian Theatre was closed with an appropriate address, and the general attention was now turned to the means of extrication from the ice. By the 17th May the seamen had so far cut it from around the ships as to allow them to float; but in the sea it was still immovable. This interval of painful inaction was employed by Mr Parry in an excursion across Melville Island. The ground was still mostly covered with softened snow, and even the cleared tracts were extremely desolate, though chequered by patches of fine verdure. Deer were seen traversing the plains in considerable numbers. Towards the north appeared another island, to which was given the name of Sabine. By the middle of June pools were every where formed; the water flowed in streams, and even in torrents, which rendered hunting and travelling unsafe. There were also channels in which boats could pass; yet throughout this month and the following the great covering of ice in the surrounding sea remained entire, and kept the ships in harbour. On the 2d of August, however, the whole mass, by one of those sudden movements to which it is liable, broke up and floated out; and the explorers had now open water in which to prosecute their great object. It was consolatory to think that this was the very season at which they had last year entered Lancaster Sound; and if they could make as brilliant a voyage this summer, the following one would see them not far from Behring's Straits. But it was not without some obstructions that on the 4th they reached the same spot where their progress had been formerly arrested. On the 15th they were enabled to make a certain advance; after which the frozen surface of the ocean assumed a more compact and impenetrable aspect than had ever before been witnessed. The officers ascended some of the lofty heights which bordered the coast; but, in a long reach of sea to the westward, no

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boundary was seen to these icy barriers. There appeared only the western extremity of Melville Island, named Cape Dundas; and in the distance a bold coast, which they named Banks' Land. As even a brisk gale from the east did not produce the slightest movement on the glassy face of the deep, they were led to believe that on the other side there must be a large body of land, by which it was held in a fixed state. On considering all circumstances, there appeared no alternative but to make their way homeward while yet the season permitted. Some additional observations were made, as they returned, on the two coasts extending along Barrow's Strait.

Mr Parry's arrival in Britain was hailed with the warmest exultation. To have sailed upwards of thirty degrees of longitude beyond the point reached by any former navigator,—to have discovered so many new lands, islands, and bays,—to have established the much-contested existence of a Polar Sea north of America,—finally, after a wintering of eleven months, to have brought back his crew in a sound and vigorous state,*—were enough to raise his name above that of any other Arctic voyager.

No hesitation was felt as to sending out another expedition; but, considering the insuperable nature of the obstacles which had twice arrested the progress of the last, it became important to consider whether there was not any other passage by which the Polar Sea, now ascertained to exist, might be reached with greater facility. In Hudson's Bay neither of the great northern sounds called the Welcome and Fox's Channel had been traced to a termination. Middleton, in the former inlet, had ascended higher than any previous discoverer; but a thick cloud had been raised around his reputation, and his *Frozen Strait*, after all, might very likely prove to

* Only one man died in the course of their long and perilous voyage, and his disease was no way referable to the toils or privations of the expedition, the origin of his malady having been of a date anterior to the sailing of the ships.

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be only a temporary barrier. If from either of these sounds an opening should be effected into the Arctic Sea, it could be navigated in a much lower latitude than that in which Parry had wintered, and might perhaps be also free from those large islands among which he had been entangled. There was accordingly fitted out a new expedition, in which the Fury, of 327 tons, was conjoined with the Hecla; the commander conceiving that two vessels of nearly equal dimensions were best calculated for co-operating with each other, while the examination of coasts and inlets could be carried on by boats. This active officer, now promoted to the rank of captain, hoisted his flag on board the Fury; while Captain Lyon, already distinguished by his services in Africa, received the command of the Hecla, and proved himself fully competent to the arduous duties of this new service. The equipment, the victualling, and the heating of the vessels, were all accomplished with the greatest care, and with various improvements suggested by experience.

The adventurers were ready to sail on the 8th May 1821, and having then quitted the Nore, passed through the Pentland Frith and by Cape Farewell, though not without suffering repeated detention; but we shall not pause till we find them, on the 2d July, at the mouth of Hudson's Strait. Captain Parry, accustomed as he was to views of Polar desolation, was struck with the exceedingly dreary aspect which these shores presented. The naked rocks, the snow still covering the valleys, and the thick fogs that hung over them, rendered the scene indescribably gloomy. The ships were soon surrounded by icebergs, amounting to the number of fifty-four,—one of which rose at least 258 feet above the sea. They were attended by large floes, and rendered very formidable by their rotatory motion. The peculiar danger of these straits, often remarked by former navigators, arises from the strong tides and currents that rush in from the ocean, and cause violent movements among the huge masses of ice with which they are usually filled. Captain Lyon had an alarming proof of their strength;

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for two of his hawsers were carried away, and the best bower anchor, weighing more than a ton, was wrenched from the bows, and broken off as if it had been crockery-ware. During these disasters the sailors were amused by the sight of three companion-ships, two belonging to the Hudson's Bay Company, and one bringing out settlers for Lord Selkirk's colony. The emigrants on board the last, who were chiefly Dutch and Germans, were seen waltzing on deck often for hours together, and were only driven into their cabins by a severe fall of snow.

Amid these obstructions the ships spent nineteen days in making seventy miles; which course, however, brought them, on the 21st, within two leagues of what are called the Savage Islands. On the following afternoon a loud shouting was heard over the ice, and soon after there appeared a numerous band of natives, paddling their canoes through the lanes of open water, or, where these failed, drawing them over the pieces of ice. Among a great number of *kayaks*, or boats rowed by a single man (see plate, p. 178), were five *oomiaks*, or women's

Oomiak, or Woman's Boat.

boats, constructed of a framework of wood and whalebone covered with deer-skins, having flat sides and bottom, and of considerable size. One of them, 25 feet by 8, contained women, boys, and young children, to the number of twenty-one. Presently began a merry, noisy scene of frolic and traffic. The natives carried it on with eagerness and even fury, stripping themselves of the very skins which formed their only covering, till

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they were in a state of absolute nudity, except the ladies, who always made a laudable reservation of their breeches. They drove what they meant should be an excessively hard bargain; yet, being wholly ignorant of the value of the rich skins with which nature has invested the animals of this climate, they raised shouts of triumph when they obtained in exchange a nail, a saw, or a razor. Their aspect was wilder and more dishevelled than that of any other tribe even among this rude race; their character also seems fiercer and more savage; and indeed it is in this quarter that most of the tragical encounters with Esquimaux have occurred. Some of the old women were pronounced to be the most hideous objects that mortal man ever beheld; inflamed eyes, wrinkled skin, black teeth, and deformed features, rendered them scarcely human; hence much apology was found for the dark suspicions cherished by Frobisher's crew respecting one of these dames, and the odd investigation to which it had prompted. The children were rather pretty; though, from being thrown carelessly into the bottom of the boats, they had much the appearance of the young of wild animals. Besides traffic, the barbarians indulged in a great deal of rather rude frolic, like that of ill-regulated schoolboys. One of them got behind a sailor, shouted loudly in one ear, and gave him a hearty box on the other, which was hailed with a loud and general laugh. They also displayed their merriment in a dance, consisting chiefly of violent leaping and stamping, though in tolerable time.

In spite of every obstruction, Captain Parry, early in August, reached the entrance of Fox's Channel, and came in view of Southampton Island. It was now the question, whether to sail directly up this inlet, and reach, by a comparatively short route, Repulse Bay and the higher latitudes, or to make the south-western circuit of Southampton Island, and ascend the beaten track of the Welcome. The captain judiciously preferred the former, notwithstanding its uncertainties, on account of the great time which would be saved should the course

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be found practicable. On the 15th he came to an opening stretching westward, and apparently separating the island from other land on the north. Hoping to find this the Frozen Strait of Middleton, he entered it; but it soon proved a spacious and beautiful basin, enclosed by land on every side. He named it the Duke of York's Bay, and considered it one of the finest harbours in the world; but, after admiring a large floe covered entirely with minerals, shells, and plants, he moved out of it, and pursued the voyage. On the 21st the navigators found themselves in another strait, not much encumbered with ice, but darkened by thick fogs; and, before they knew distinctly where they were, a heavy swell from the southward showed that they had already passed through the Frozen Strait, and were in the broad channel of the Welcome. They speedily entered Repulse Bay, in which modern speculation had cherished the hope of a passage; but a short investigation made by boats in every direction proved that it was really, as Middleton had described it, completely enclosed. A good deal of time had thus been lost through the scepticism so unjustly attached to the narrative of that eminent seaman.

Captain Parry, having come with all speed out of Repulse Bay, began the career of discovery along a coast hitherto unknown. An inlet was soon observed, and called by the name of Gore; but was not found to extend far into the interior. At the mouth of this opening the valleys were richly clad with grass and moss, the birds singing, butterflies and other insects displaying the most gaudy tints, so that the sailors might have fancied themselves in some happier climate, had not the mighty piles of ice in the Frozen Strait told a different tale. Hunting-parties traversed the country in various directions, and the game-laws of the preceding year were strictly enforced, by which every beast or bird was to be relinquished for the general good, allowing only the head and legs as a *douceur* to the captor. The latter, however, adopted and made good a theory,

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agreeably to which the description *head* was greatly extended, so as to include even several joints of the back-bone.

Having passed Gore Inlet, the discoverers found themselves among those numerous isles described by Middleton, which formed a complete labyrinth of various shapes and sizes, while strong currents setting between them in various directions, amid fogs and drifting ice, rendered the navigation truly perilous. The Fury was assailed by successive masses; her anchor was dragged along the rocks with a grinding noise, and on being drawn up, the two flukes were discovered to be broken off. The same vessel was afterwards carried forward by a violent stream, amid thick mist, the people on board finding it impossible either to guide or alter her direction; so that Captain Parry considers it altogether providential that she was not dashed to pieces against the surrounding rocks. However, one channel, and one only, was observed, by which the mariners at last made their way through this perilous maze. No sooner had they reached the open sea, than, being obliged to run before a strong northerly breeze, they were much disheartened to find themselves, on the 3d of September, at the very point which they had left on the 6th of August. All the interval had been employed in the merely negative discovery, that there was nothing to discover.

The commander soon reached the northern coast, and resumed his task, which was rendered very tedious by the necessity of examining every opening and channel, in the hope that each might prove the desired passage into the Polar Ocean. He first explored a large inlet, the name of which he gave to Captain Lyon,—then a smaller one, which was named from Lieutenant Hoppner; and by connecting these with Gore Inlet, he completed his delineation of the coast. The seamen had again the pleasure of opening a traffic with a party of Esquimaux, whose first timidity was soon overcome by the hope of being supplied with some iron tools. In

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the course of this transaction, the surprise of the crew was roused by the conduct of a lady, who had sold one boot, but obstinately retained the other, in disregard of the strongest remonstrances as to the ridiculous figure she in consequence made. At length suspicion rose to such a pitch, that, all courtesy being set aside, her person was seized, and the buskin pulled off. Then indeed it proved a complete depository of stolen treasure, there being no less than two spoons and a pewter-plate secreted within its capacious cavity.

The end of September now approached, and Captain Parry found himself suddenly in the depth of winter. Snow had been falling during the whole of the short summer; but the united warmth of the air and earth had melted it as it fell, and left the ground still open to the sun's rays. In one moment, as it were, it made good its lodgement, spreading its white and dazzling mantle over land and sea; and the solar beams being then no longer able to reach the soil, the whole became subject to permanent and impenetrable frost. Some parts of the snow were indeed dissolved, and then refrozen in varied and beautiful forms of crystallization; whereas at Melville Island the covering once spread over nature had never changed its aspect. A more alarming symptom appeared in the rapid formation of the soft or pancake ice on the surface of the deep. The obstacle thereby occasioned was at first so slight as to be scarcely felt by a ship before a brisk gale; but it continually increased, till at length the vessel, rolling from side to side, became like Gulliver bound by the feeble hands of Lilliputians. At the same time the various pieces of drift-ice, which were tossing in the sea without, had been cemented into one great field called "the ice," that threatened every moment to bear down upon the brigs, and dash them in pieces. Under this combination of circumstances, the navigators could no longer even attempt to reach the land, but determined to saw into the heart of an adjoining floe, and there take up their winter-quarters. There was about half a mile to penetrate,

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which, in the soft state of the pancake-ice, was not very laborious. It was, however, far from pleasant, as it bended like leather beneath their feet, and caused them sometimes to sink into the water, whence it was impossible they could escape without a very cold bath.

Captain Parry was now frozen up for another winter in the midst of the Northern Sea, and he forthwith applied himself to make the necessary arrangements with that judicious foresight which had been already so conspicuous in the same trying circumstances. As the result of experience, not less than of several ingenious contrivances, the ships were much more thoroughly heated than in the former voyage; the provisioning, too, was more ample, and antidotes against scurvy still more copiously supplied. The Polar Theatre opened on the 9th November with "The Rivals." The two captains appeared as Sir Anthony and Captain Absolute; while those who personated the ladies had very generously removed an ample growth of beard, disregarding the comfortable warmth which it afforded in an Arctic climate. The company were well received, and went through their performances with unabated spirit; yet this season does not seem to have gone off quite with the same eclat as the preceding. Novelty, from the first the chief attraction, had worn off, and the discomfort of a stage, the exhibitions of which were attended with a cold thirty degrees under the freezing-point, became rather severe. The sailors found for themselves a more sober and useful, as well as efficacious remedy against *ennui*. They established a school, in which the better-instructed undertook to revive the knowledge of letters among those who had almost entirely lost the slight tincture that they had once imbibed. These hardy tars applied themselves to their book with ardent and laudable zeal, and showed a pride in their new attainments like that of little boys in their first class. At Christmas sixteen well-written copies were produced by those who, two months before, could scarcely form a letter. Amid these varied and pleasing occupations, the shortest day

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passed over their heads almost unobserved, especially as the sun did not entirely leave them. Captain Lyon never saw a merrier festival than was celebrated on board. The sailors, being amply regaled with fresh beef, cranberry-pies, and grog, became so extremely elevated, that they insisted on drinking, with three hearty cheers, the health of each officer in succession.

The animal creation in this less rigorous climate, even though the ground was completely frozen over, did not disappear so entirely as on Melville Island. A few solitary hares were caught; but they were in a miserable state of leanness, weighing only five or six pounds, and had a purely white covering, which resembled swan's down rather than hair. About a hundred white foxes were snared in the nets during the winter. These beautiful creatures, when first taken, were perfectly wild and ungovernable; but in a short time the young ones at least threw off this timidity. A delicate little quadruped entrapped one day proved to be an ermine; but it was excessively frightened, and to the general regret died soon afterwards.

The winter months were also enlivened by various striking appearances which the sky at that season presented. The northern world, when the sun departs, is by no means involved in that monotonous gloom which such a privation might seem to indicate. After the solar beams have finally quitted the earth, and the long winter has closed in, the heavens become a gay scene, through which the most brilliant meteors are perpetually playing. Those singular streams of light, called commonly the *Aurora Borealis*, keep up an almost incessant illumination, and were frequently witnessed in full splendour by Captains Parry and Lyon during their Arctic residence. The light had a tendency to form an irregular arch, which, in calm weather, was often very distinct, though its upper boundary was seldom well defined; but, whenever the air became agitated, showers of rays spread in every direction, with the rapidity of lightning. Sometimes long streaks of light were spread

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out with inconceivable swiftness, but always appearing to move to and from a fixed point, somewhat like a riband held in the hand and shaken with an undulatory motion. No rule, however, could be traced in the movement of those lighter parcels called "the merry dancers," which flew about perpetually towards every quarter; becoming in stormy weather more rapid in their motions, and sharing all the wildness of the blast. They gave an indescribable air of magic to the whole scene, and made it not wonderful that, by the untaught Indian, they should be viewed as "the spirits of his fathers roaming through the land of souls."

Several questions have been agitated with respect to the *Aurora*. It has been said to be accompanied with a hissing and cracking noise; and indeed Captain Lyon observes, that the sudden glare and rapid bursts of those wondrous showers of fire make it difficult to fancy their movements wholly without sound;—yet nothing was ever really heard. Captain Parry complains that he could not expose his ears to the cold long enough completely to ascertain the point; but his colleague declares that he stood for hours on the ice listening, and at a distance from every sounding body, till he became thoroughly satisfied that none proceeded from the *Aurora*. It has also been questioned whether this meteor ever completely hid the stars; and it was generally decided, on this occasion, that it dimmed the lustre of those heavenly bodies, as if a thin gauze veil had been drawn over them,—an effect which was augmented when several luminous portions were spread over each other. In a clear atmosphere these lights shone with a brightness which gave the impression that they were nearer than the clouds; but whenever these last overspread the sky the *Aurora* was hid by them, and must therefore have been more distant. To Captain Parry it appeared to assume tints of yellow and lilac; but to Captain Lyon its colour always resembled that of the Milky-Way, or of very vivid sheet-lightning. The present writer saw this phenomenon once, and only

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once, in its utmost brilliancy, and exhibiting all the appearances described by these northern observers. His impressions agree perfectly with those of Captain Lyon.

Other luminous meteors, arising apparently from the refraction caused by the minute and highly crystallized spiculæ of ice, appear in succession to embellish the northern sky. The sun and moon are often surrounded with halos,—concentric circles of vapour, tinted with the brightest hues of the rainbow. Parhelia, or mock suns, frequently adorned with these accompaniments, shine at once in different quarters of the firmament. Ellis, who was with Moor and Smith in Hudson's Bay, has seen six at the same moment. They are most brilliant at daybreak, diminish in lustre as the sun ascends, but again brighten at his setting. The solar orb itself, for some time before it finally departs for the winter, and also after its reappearance in spring, tinges the sky with hues of matchless splendour. The edges of the clouds near that luminary often present a fiery or burnished appearance, while the opposite horizon glows with a deep purple, gradually softening as it ascends into a delicate rose-colour of inconceivable beauty. As at these periods he never rises more than a few degrees above the horizon, he is, as it were, in a state of permanent rising and setting, and seems to exhibit longer and more variously the beautiful appearances produced by that position. At this time the naked eye can view him without being dazzled; and Captain Lyon considers the softened blush-colour that his rays exhibit through frost as possessing a charm which surpasses even that of an Italian sky.

Notwithstanding all these resources, the monotony of the scene was beginning to be oppressive, when it was relieved by an unexpected incident, which attracted universal attention. On the morning of the 1st February, a number of distant figures were seen moving over the ice, and, when they were viewed through glasses, the cry was raised, "Esquimaux! Esquimaux!" As it was of great importance to deal

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kindly and discreetly with these strangers, the two commanders, attended by a small party, proceeded towards them, walking in files behind each other, that they might cause no alarm. The natives then formed themselves into a line of twenty-one, advanced slowly, and at length making a full stop, saluted the strangers by the usual movement of beating their breasts. They were substantially clothed in rich deer-skins, and appeared a much quieter and more orderly race than their rude countrymen of the Savage Islands. As soon as the seamen produced their precious commodities, knives, nails, and needles, an active traffic was set on foot; and the females, on seeing that much importance was attached to the skins which constituted their clothing, began immediately to strip them off. The captains were alarmed for the consequences in a temperature more than fifty degrees below the freezing point; but were soon consoled by observing that the ladies had another comfortable suit under the furs. The strangers were now cordially invited to enter their habitations, to which they agreed most readily, although there appeared no habitations to enter. However, they were led to a hole in the snow, and instructed to place themselves on their hands and knees, in which position, having crept through a long winding passage, they arrived at a little hall with a dome-shaped roof, whence doors opened into three apartments, each occupied by a separate family. These proved to be five distinct mansions, tenanted by sixty-four men, women, and children. The materials and structure of these abodes were still more singular than their position. Snow, the inseparable accompaniment of the northern tempests, became here a protection against its own cold. It was formed into curved slabs of about two feet long and half a foot thick, put together by a most judicious masonry, so as to present a species of structures resembling cupolas, rising about seven feet above the ground, and from fourteen to sixteen in diameter. The mode of inserting the key-slab, which bound the whole together, would,

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it is said, have been satisfactory to the eye of a regularly bred artist. A plate of ice in the roof served as a window, and admitted the light as if through ground glass; which, when it shone on the interior of the mansions, in their first state of pure transparency, produced soft tints of green and blue. But, alas! ere long, accumulated dirt, smoke, and offal, converted these apartments into a scene of blackness and stench. This little village appeared at first like a cluster of hillocks amid the snow; but successive falls filled up the vacuities, and converted it almost into a smooth surface, so that even boys and dogs were seen walking and sporting over the roofs; though as summer and thaw advanced, a leg sometimes penetrated, and presented itself to the inmates below. Then, too, the ceiling begins to drip; and the tenants, after repeatedly endeavouring to patch it with fresh slabs, and catching, of course, some severe colds, are obliged to betake themselves to a more durable covering. In each room, suspended from the roof, burns a lamp, with a long wick formed of a particular species of moss, fed with the oil of the seal or the walrus, and serving at once for light, heat, and cookery. The family sit round the apartment on a bench formed of snow, strewed with slender twigs, and covered with skins; but this part of the dwelling must be carefully kept a good deal below the freezing-point, since a higher temperature would speedily dissolve the walls of the frail tenement.

After this friendly visit, an invitation was given to the Esquimaux to repair to the ships, when fifty accepted it with alacrity. Partly walking, and partly skipping, they speedily reached the vessels, where a striking congeniality of spirit was soon found to exist between them and the sailors; boisterous fun forming to each the chief source of enjoyment. A fiddle and drum being produced, the natives struck up a dance, or rather a succession of vehement leaps, accompanied with loud shouts and yells. Seeing the Kabloonas, or Whites, as they called our countrymen, engaged in the game of leap-frog, they

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Snow-village.

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attempted to join; but not duly understanding how to measure their movements, they made such over-leaps as sometimes to pitch on the crown of their heads: however they sprang up quite unconcerned. Their attention was specially attracted to the effects of a winch, by which one sailor drew towards him a party of ten or twelve of their number, though grinning and straining every nerve in resistance; but finding all in vain, they joined in the burst of good-humoured laughter till tears streamed from their eyes. One intelligent old man followed Captain Lyon to the cabin, and viewed with rational surprise various objects which were presented. The performance of a hand-organ and a musical snuff-box struck him with breathless admiration; and on seeing drawings of the Esquimaux in Hudson's Strait, he soon understood them, and pointed out the difference between their dress and appearance and that of his own tribe. On viewing the sketch of a bear, he raised a loud cry, drew up his sleeves, and showed the scars of three deep wounds received in encounters with that terrible animal. The crews were desirous to treat their visiters to such delicacies as the ship afforded, but were for some time at a loss to discover how their palate might be best gratified. Grog, the seaman's choicest luxury, only one old woman could be induced to taste. Sugar, sweetmeats, gingerbread, were accepted merely out of complaisance, and eaten with manifest disgust; but train oil, entrails of animals, and any thing consisting of pure fat or grease, were swallowed in immense quantities, and with symptoms of exquisite delight. This taste was first evinced by an elderly female, who, having sold her oil-pot, took care previously to empty the contents into her stomach, and lick it clean with her tongue, regardless though her face was thereby rendered as black as spot. Captain Lyon being disposed to ingratiate himself with rather a handsome young damsel, presented her with a good moulded candle, six in the pound. She immediately began to eat off the tallow with every appearance of

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the greatest enjoyment, after which she thrust the wick into her mouth; but the captain, concerned for the consequences to this delicate virgin, insisted on pulling it out. In preference to strong liquors they drank water in the most enormous quantities, by gallons at a time, and two quarts at a draught; a supply of liquid which is perhaps necessary to dissolve their gross food, and which, being obtained only from snow artificially melted, is a scarce article in winter.

The Esquimaux were attended by a large pack of wolves, which seemed to follow them with the view of picking up whatever might be found straggling or defenceless about their habitation. These animals continued through the whole season intensely pressed with hunger, and in eager watch for any victim which might come within their reach. For this purpose they took a station between the huts and the ships, ready to act against either as circumstances might dictate. They did not indeed attack the sailors, even when unarmed, though they were often seen hovering through the gloom in search of food; but every stray dog was seized, and in a few minutes devoured. Two broke into a snow-house close to the vessels, and carried off each a dog larger than himself; but, being closely pursued, one of them was obliged to drop his booty. In the extremity of their hunger, in fact, they hesitated not to devour the cables and canvass. A deadly war was therefore waged against these fierce animals, of which thirteen were killed in the course of the season, and sent to be eaten by the Esquimaux,—a present which was received with much satisfaction.

As spring advanced, the attention of the officers was almost wholly engrossed by the prospects of discovery during the approaching summer. Their neighbours, by no means destitute of intelligence, and accustomed to shift continually from place to place, were found to have acquired a very extensive knowledge of the seas and coasts of this part of America. One female, in particular, named Iligliuk, who bore even among her

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countrymen the character of "a wise woman," was, after a little instruction, enabled to convey to the strangers the outlines of her geographical knowledge in the form of a rude map. A pencil being put into her hand, she traced the shore from Repulse Bay with such a degree of accuracy as inspired great confidence in what she might farther delineate. She then began to exhibit a coast reaching far to the north, being, in fact, the eastern limits of Melville Peninsula. Next her pencil took a western direction, when her farther progress was watched with the deepest interest; in the course of which she represented a strait between two opposite lands, that extended westward till it opened on each side, and spread into an ocean apparently unbounded. This sketch, which promised to fulfil their most sanguine hopes, gratified the officers beyond measure, and they loaded Iligliuk with attentions which unluckily soon turned her head, and made her so conceited and disdainful, that they were obliged to discontinue their notice of her.

Captain Lyon, in the middle of March, undertook a journey across a piece of land, lying between the station of the ships and the continent, which had been named Winter Island. The party were scarcely gone when they encountered a heavy gale, bringing with it clouds of drift, and a cold so intense that they could not stop for a moment without having their faces covered with frost-bites. After some vain struggles they determined to pitch their tent; but as the temperature within was at zero, and continually lowering, they felt that they could not live through the night under such shelter. They therefore dug a cave in the earth, and by huddling together round a fire, immersed in smoke, to which no vent was allowed, contrived to keep up some portion of warmth, though still ten or fifteen degrees below the freezing-point. In the morning their sledge was too deeply buried beneath the drift to leave any hope of digging it out, and they could not reach the ships, now six miles distant, except by pro-

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ceeding on foot through a tempest of snow falling so thick that they could not see a yard before them. Finding sometimes no track, sometimes several leading in different directions, they were soon bewildered, and wandered they knew not whither among heavy hummocks of ice. The frost-bites were so numerous that they could not muster hands enough to rub the parts affected, and some began to sink into that dreadful insensibility which is the prelude to death by cold, and to reel about like drunken men. In fact, they had resigned almost every hope of escape, when providentially there appeared a newly beaten track, which they determined to follow, and in ten minutes it led them to the ships. Their arrival there caused indescribable joy, as they had been nearly given up for lost; while no one could be sent in search of them without imminent risk of sharing their fate.

On the 8th May, in a more favourable season, Captain Lyon undertook another journey. In a few hours he crossed Winter Island, and reached the strait separating it from the continent, covered with heavy grounded ice very difficult to walk upon. The sun, now powerful, produced such a glare on the snow as affected several of his attendants with severe blindness; while the only means of procuring water was by holding up plates of ice in the solar rays, by which they were gradually melted. The party, having reached the mainland, proceeded a considerable way along the coast, crossing several bays; but at last they came in view of a bold cape, which they fondly hoped was the extreme point of America. Here they were overtaken by a storm of snow, but not accompanied like the other with perilous cold; it melted as it fell, and formed a pulp which penetrated into their tents, yet did not dissolve so completely as to be fit for drinking. This storm kept them imprisoned sixty-eight hours; which dreary interval they enlivened by reading in turn from three books they chanced to have with them, and as soon as the sun began to gleam they hastened to return to the ships.

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The end of May presented a gloomy aspect, the season being still more backward than in the more northerly and rigorous climate of Melville Island. The snow was melted only on some spots, and hardly any symptoms of vegetation were yet visible; but, as there was an extent of open water in the sea without, Captain Parry determined upon sawing his way to it. This was a most laborious process, the ice being much thicker and stronger than at the commencement of the season; and after the men had continued at it more than two weeks, and were within forty-eight hours of completing a canal, the body of the ice made a movement which closed it entirely up. As they were looking on in despair at this disaster, another passage opened, which they attempted to render available; but it, too, was closed in the same manner. Yet these agitations had at last the effect of causing the whole mass to float out into the open sea, and thus leaving to them an unobstructed outlet.

On the 2d July they resumed their voyage of discovery. They had a favourable run through this entrance, which formed a continuation of Fox's Channel; but a strong current from the north was still bringing down the ice with great force. The Hecla underwent some severe pressures, and, within five or six hundred yards of the Fury, two large floes dashed against each other with such a tremendous concussion that numberless huge masses were thrown fifty or sixty feet into the air. The vessel, had she come for a second within the sphere of these movements, must have been crushed to pieces,—happily she escaped. This current, however, was highly promising, since it could not be traced to the mouth of Hudson's Strait, and must therefore, they concluded, have come from the Western Ocean, which they were so anxious to reach.

The ice passed by, and the ships proceeded with a favouring wind and tide. The shores began now to put on their summer aspect; the snow had nearly disappeared; and the ground was covered with the richest

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bloom of Arctic vegetation. The navigators came to a fine river named Barrow, which formed a most picturesque fall down rocks richly fringed with very brilliant plants. Here the rein-deer sporting, the eider-duck, the golden-plover, and the snow-bunting, spreading their wings, produced a gay and delightful scene. On the 14th they reached the island of Amitioke, which had been described as situated near the strait they were then endeavouring to attain. They saw about two hundred walruses lying piled, as usual, over each other on the loose drift-ice. A boat's crew from each ship proceeded to the attack; but these gallant amphibia, some with their cubs mounted on their backs, made the most desperate resistance, and one of them tore the planks of a boat in two or three places. Three only were killed, the flesh of which was found tolerable, affording a variety amid the ordinary sea-diet.

The discoverers now proceeded northwards, and saw before them a bold and high range of coast, apparently separated from that along which they were sailing. This feature, agreeing with the indications of Iligliak, flattered them that they were approaching the strait exhibited by her as forming the entrance into the Polar Basin. They pushed on full of hope and animation, and were farther cheered by reaching the small island of Igloolik, which she had described as situated at the very commencement of the passage. Accordingly, they soon saw the strait stretching westward before them in long perspective; but, alas! they discovered at the same moment an unbroken sheet of ice from shore to shore, crossing and blocking up the passage; and this not a loose accidental floe, but the field of the preceding winter, on which the midsummer sun had not produced the slightest change. Unable to advance a single step, they amused themselves with land-excursions in different directions; and Captain Parry at length determined, on the 14th August, with a party of six, to undertake an expedition along the frozen surface of the strait. The journey was very laborious, the ice being sometimes thrown up in rugged hummocks,

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and occasionally leaving large spaces of open water, which it was necessary to cross on a plank, or on pieces of ice, instead of boats. In four days they came in view of a peninsula terminated by a bold cape, the approach to which was guarded by successive ranges of strata, resembling the tiers or galleries of a commanding fortification. The party, however, scrambled to the summit, whence they enjoyed a most gratifying spectacle. They were at the narrowest part of the strait, here about two miles across, with a tide or current running through it at the rate of two miles an hour. Westward the shores on each side receded till, for three points of the compass and amid a clear horizon, no land was visible. The captain doubted not that from this position he beheld the Polar Sea; into which, notwithstanding the formidable barriers of ice which intervened, he cherished the most sanguine hopes of forcing his way. He named this the Strait of the Fury and Hecla, and gave the sailors an extra can of grog, to drink a safe and speedy passage through its channel.

He now lost no time in returning to the ships, where his arrival was very seasonable; for the opposing barrier, which had been gradually softening and breaking into various rents and fissures, at once almost entirely disappeared, and the vessels next morning were in open water. On the 21st they got under weigh; and, though retarded by fogs and other obstructions, had arrived on the 26th at that central and narrowest channel which the commander had formerly reached. A brisk breeze now sprang up, the sky cleared, they dashed across a current of three or four knots an hour, and sanguinely hoped for an entire success, which would compensate so many delays and disappointments. Suddenly it was announced from the crow's nest, that ice, in a continuous field, unmoved from its winter station, occupied the whole breadth of the channel. In an hour they reached this barrier, which they found soft, porous, and what is termed rotten. Spreading all their canvass, they bore down upon it, and actually forced their way through a

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space of three or four hundred yards; but there they stuck, and found their progress arrested by an impenetrable mass. From this point, during the whole season, the ships were unable to advance a single yard; nor had the crews any means of exerting their activity except in land-journeys. Captain Lyon undertook an expedition southward, to ascertain if any inlet or passage from sea to sea, in this direction, had escaped notice. The country, however, was so filled with rugged and rocky hills, some a thousand feet high, and with chains of lakes in which much ice was floating, that he could not proceed above seven miles. Though it was the beginning of September, the season was only that of early spring; and the buds of the poppy and saxifrage were just unfolding, to be prematurely nipped by the fast-approaching winter.

More satisfactory information was derived from another excursion made by Messrs Reid and Bushman, who penetrated sixty miles westward along the southern coast of Cockburn Island, till they reached a pinnacle, whence they saw, beyond all doubt, the Polar Ocean spreading its vast expanse before them; but tremendous barriers of ice filled the strait, and precluded all approach towards that great and desired object.

It was now the middle of September, and the usual symptoms, of deer trooping in herds southward, floating pieces of ice consolidating into masses, and the thin pancake-crust forming on the surface of the waters, reminded the mariners, not only that they could hope for no farther removal of the obstacles which arrested their progress, but that they must lose no time in providing winter-quarters. The middle of the strait, at the spot where they had been first stopped, occurred as the station whence they would be most likely to push future discovery; but prudence suggested a doubt, whether the ships, enclosed in this icy prison with such strong barriers on each side, might ever be able to effect their extrication. The chance of being shut up here for eleven months amid the privations of an Arctic winter,

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appeared, at all events, a serious consideration. By returning to Igloolik, they would be ready to catch the earliest opening, which was expected to take place on the eastern side, from whence a few days would bring them back to their present station.

On the 30th October, by the usual operation of sawing, the ships were established in a harbour at Igloolik. The ensuing season was passed with the most careful attention to the health and comfort of the crews; but though their spirits did not sink, there appears to have been, on the whole, less of gayety and lightness of heart than in the two former years. We hear nothing of the drama or even of the school. In this position, north of Winter Island, they were deprived for about seven weeks of the sun's cheering beams. On the 2d December refraction still showed, from the deck of the Fury, about the sixteenth part of his disk. At the new year *Arcturus* and *Capella*, stars of the first magnitude, were visible half an hour before and after midday. On the 5th January 1823, the horizon was so brightly suffused with red that they hoped erelong to see the sun's orb burst forth; but a fortnight of thick fog occasioned a disappointment. On the 19th, the sky having cleared, they saw him rise attended by two parhelia, and both crews turned out to enjoy the novelty and splendour of this cheering spectacle.

The sailors found at Igloolik a colony of Esquimaux, who received them at first with surprise and some degree of alarm; but on learning they were from Winter Island, and intimate with its tenants of last season, they welcomed them as familiar acquaintances. These natives belonged to the same tribe, and were connected by alliance and close relationship with many individuals of the party now referred to; of whom, therefore, they were delighted to receive tidings. The crews spent the winter with them on a friendly footing, and rendered important services to many individuals during a period of severe sickness. This intercourse, however, was not on the whole nearly so satisfactory as in the former place

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and season. It began to be observed that their attachment to the Kabloonas was greatly prompted by interest and by the hope of extracting presents; that they begged for food and gifts almost without intermission, and yet showed no gratitude on receiving them; and that they took much less into consideration what they themselves got than what others got more than they. The indifference shown towards such of their own tribe as were in a debilitated and suffering state was viewed also with much dissatisfaction. Kagha, a widow, cursed certainly with a most frightful temper, was found almost perishing through neglect. Captain Lyon took her into his own cabin, where, however, her filth and scolding made her a perfect nuisance; so that, after being recruited and clothed in two folds of deer-skin, she was remanded to the huts. Ten days having elapsed, she was found at the point of death, solely, as it appeared, from want of food; and, though removed immediately to the ship's hospital, she died on the morrow. Our people were also much displeased at the stoical firmness with which the relations received notice of two of their deceased kindred, whom the dogs had dug up from under the snow, that formed their only covering, and then devoured. It was indeed very difficult to find an earthy grave beneath the glebe, now frozen as hard as rock; but an Esquimaux acquaintance having lost his wife, the sailors piled over her such a heap of stones as might defy the attempts of all the animals wild and tame, which prowl throughout this dreary region. The man gave thanks, but not cordially; he even expressed a dread lest the pressure of this huge pile would be painfully felt by his deceased spouse; and soon after, when an infant died, he declared her wholly incapable of bearing such a burden, and would allow nothing but snow to be laid over her.

This people, during the expedition, became the subjects of a more minute observation than had ever before been made upon them by Europeans. They constitute a very widely-diffused race, occupying all the shores of the

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Northern Ocean, and embracing nearly the entire circuit of the globe. Richardson and Franklin found them along the whole coast of the American Polar Sea, and Kotzebue in the channel near Behring's Straits. The Samoiedes and Kamtschadales, in Northern Asia, seem to belong to the same family. A similarity of visage and figure, boats, huts, and instruments,—even a resemblance in habits, character, and mode of life,—might have been produced by the common pressure of the same peculiar circumstances. The affinity of speech, however, which is such as proves the dialects of all the Esquimaux to be mere varieties of one common language, affords a clear proof that an original race from some one quarter has spread over the whole range of those immense and desolate shores. This migration must have been facilitated by the vast continuity of coast which stretches along the Arctic Ocean, and is not equalled in any other quarter. Hence, probably, these tribes, at distant ages, connected the old and the new continents, which otherwise were then wholly unknown to each other.

Their external form seems influenced, and as it were characterized, by the severity of the climate. Their stature is decidedly lower than that of the European; five feet nine inches being considered even in a man as almost gigantic; and though the trunk of the body is somewhat thick, all the extremities are small, especially the hands and feet, and the fingers short. The face is broad and flat, the nose small, and at the same time sunk so deep, that in some instances a ruler could be applied from cheek to cheek without touching it. It is somewhere observed that their visage presents that peculiar form which the human face naturally assumes under exposure to intense cold, when all the projecting features are drawn in and the cheeks consequently pushed out. In the same way the action of the weather may perhaps produce the high cheekbones of mountaineers. Under these modifications, however, both their body and limbs are very tolerably shaped. Even the female countenance, though without pretensions to regular beauty,

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Group of Esquimaux.

is often agreeable, having a frank and good-humoured expression; and, were it cleared of the thick crust of grease and dirt, so as to exhibit the real complexion, which is only that of a deep brunette, it might, even in Europe, be reckoned handsome. The skin is unctuous and unpleasantly cold to the touch; the flesh soft and flabby; owing probably to the fat animal substances which form the principal part of their food.

Dress, through the necessity imposed by the climate, is much more ample, and prepared with greater care than is usual among other savage tribes. That of the

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men chiefly consists in a double coat of deer-skin; the inner part of which, having the hair placed next the body, serves as a shirt, while from the outer a spacious hood is raised to cover the head. The breeches of the same material, and also double, reach down, overlapping the boots, which extend to the knee, and are composed either of deer-skin, or, if intended for hunting and travelling, of the hide of the seal or walrus. The dress of the females comprehends the same articles, with only some variations in form. They considered themselves particularly fortunate in wearing breeches, and could not hear without pity of their sisters in Europe, whom the caprice of fashion had deprived of so comfortable an habiliment. Their chief distinction lay in their boots, framed of such capacious dimensions as to make each leg appear as thick as the body, and allow them to move only with a waddling gait, similar to that of Muscovy ducks. These boots, however, form most spacious receptacles for whatever goods, lawful or unlawful, may come into the possession of the wearer. Captain Parry suspects that this huge buskin was originally constructed as a receptacle for their children,—a use still made of it among some tribes,—and thus retains its old form, though the hood is now generally substituted for this domestic purpose.

The Esquimaux do not huddle on these garments in a rude and careless manner, as a mere protection against the fierce influence of the climate; they display, like other savages, a passion for embellishment and finery. Their clothes are neatly sewed with threads made from the sinews of animals; the effect of their rich furs is heightened by being arranged in stripes of various colours, and by fringes along the border, adjusted often with considerable taste. They sought anxiously for beads, in lieu of which they had ornamented themselves with girdles composed of the teeth of the fox, wolf, or musk-ox, and one female had fringed her jacket with a long row of fox's noses. It was suspected that these decorations might be regarded in some degree under the

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character of amulets or charms. Nor do they omit that universal ornament of savages, the painting of the skin, —a process which is executed, not by the Indian method of puncturing, but by a particular species of sewing. The women draw under the epidermis a needle, with a thread dipt in lamp-black and oil, which being taken out, and pressure applied to the part, leaves behind it a permanent olive tint. This operation, when performed with complete success, does not draw blood; but it is seldom carried to that degree of perfection. The face, arms, thighs, and sometimes the breasts of the females, are profusely covered with this rude figuring.

The labour necessary for subsistence under this rigorous climate is more arduous, and occupies a greater share of time, than among any other race, either civilized or savage. The ground, frozen for more than nine months of the year, yields neither root nor herb which can form a standard article of food. No tame animals are reared for this purpose; the dogs being so applied only in the last extremity. Their main resource is the chase of the wild animals which inhabit the sea and the shore. They lead, accordingly, a life of contrivance and adventure, in the course of which energy and hardihood of character are formed, and many faculties amply developed. In the absence or extreme scarcity of wood and iron, they use bones, which they have of all shapes and sizes; yet these are often found too inflexible a material; while their cord or line is formed by cutting the toughest and most elastic skins into long stripes. During the short summer, they pursue with bow and arrow the deer, whose flesh as meat and whose hide as clothing are esteemed above all others. The eider and other ducks also furnish them with food; while the skin, with the feathers inwards, supplies a light and comfortable dress. The early winter, however, compels these animals, in large bands, to move into more genial climes; and hence, for nine months in the year, subsistence must be found in the waters. These indeed are filled with the large cetaceous animals, the seal, the walrus, and

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Esquimaux watching a Seal-hole.

even the whale; but the hunters and the game are separated by a thick covering of ice. These creatures, however, though they make their chief dwelling beneath the waves, as formerly observed, experience the necessity of ascending from time to time for the purpose of respiration. The Esquimaux watch with the most indefatigable patience for their appearance, often erecting a little snow-shed to protect them from the cold, and the instant any one of them is visible, strike into him a dart or harpoon, of which they have several forms and sizes, and sometimes throw it by means of a long line,—a necessary part of their apparatus. Their grandest achievement, however, consists in the attack of the whale himself; on which occasion a large body of them assemble, armed with a variety of weapons. When struck he instantly plunges into the water; but, being obliged to come up at short intervals, is always assailed afresh, till, overcome by fatigue and loss of blood, this mighty monarch of the deep remains an unresisting prey. An Esquimaux does not hesitate, even singly, to attack the Polar bear, the fiercest and most terrible of all the Arctic races. In this encounter, however, he must be aided by a band of his trusty dogs, which rush

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fearlessly on, keep the animal at bay, and threaten him on all sides; while the master advances with his spear, and avoiding, with almost preternatural agility, the furious springs of the enraged monster, pierces him with repeated strokes. Nooses, springes, and traps, are also used with skill, chiefly against birds and foxes.

But they show little prudence in the management of their supplies. The instant that tidings transpire of the capture of a walrus, shouts of exultation are raised through the village, whose inhabitants share the prize in common. On its arrival, slices are instantly cut out, every lamp is supplied with oil, the houses are in a blaze; all the pots are filled with flesh, and the women, while cooking, pick out and devour the most dainty morsels. The feast prepared, one man takes up a large piece, applies it to his mouth, and severs with his teeth as much as that cavity can possibly admit; then hands it to his neighbour, and he to the next, till all is consumed. A new piece is then supplied, and thus the process continues, almost without intermission, till the animal is entirely devoured. To the capacity of an Esquimaux stomach there seems scarcely any limit. Some experiments on the subject made in the Fury, and carefully noted, produced the most surprising results. A youth named Toolooak stands recorded, as having in twenty-one hours received into his stomach ten pounds four ounces of solid food, a gallon and a pint of water, with more than a pint of soup. Captain Lyon pitched against him Kangara, who in nineteen hours finished nine pounds fifteen ounces of solid, and a gallon and a half of fluid. At this rate the most ample store very speedily disappears; one day they are labouring under fever, hemorrhage, and all the maladies incident to repletion; a few days after they are without a morsel to eat.

Considered as to their intellectual condition, this people have not the least tincture of what goes by the name of learning; can form no abstract idea; nor count above ten, the number of their fingers. Yet, amid a life somewhat varied and eventful, many faculties,

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without any artificial culture, are spontaneously developed. We have seen the skill displayed in the construction of their houses, as well as in pursuing and killing the various tenants of the earth and of the waters, on which their subsistence depends. Their migratory habits give them a considerable extent of local and geographical knowledge, which they are even in a certain degree able to systematize and delineate. They are also shrewd and intelligent in all the affairs of common life, and possess a considerable talent for humour and mimicry.

In their moral qualities, the Esquimaux, or at least this particular tribe, present much that is worthy of commendation. At the first opening of the intercourse, the most undeviating integrity marked all their conduct, —though this quality, in the course of two winters' communication, was considerably undermined. They were exposed indeed to most severe trials of virtue, by seeing constantly scattered about the ships little planks, pieces of iron, and empty tin pots,—a temptation to them not less formidable than if the decks had been strewed with gold and jewels. It also came to their knowledge that, in some of their early exchanges, rich skins had been bartered for beads and other trifles of no real value,—a system against which they exclaimed as absolute robbery. From first to last honesty was practised among themselves in a manner worthy of the golden age. Their dresses, sledges, and all their implements of hunting and fishing, were left exposed inside or outside of the huts, without any instance being known of their having been carried off. Property, without the aid of laws and tribunals, was in the most perfect security. The common right to the products of the chase marks also a singular union, without seeming to relax their diligence in search of food, though it may perhaps contribute to their very thoughtless consumption of it. The navigators admit that they were received with the most cordial hospitality into the little huts, where the

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best meat was set before them, and the women vied with each other in the attentions of cooking, drying, and mending their clothes. "The women working and singing, their husbands quietly mending their lines, the children playing before the door, and the pot boiling over the blaze of a cheerful lamp," gave a pleasing picture of savage life. Yet a continued intercourse with them showed that they inherit their full share of human frailty. Begging we shall pass over, though in many instances persevering and importunate, because it seems to have been called forth almost entirely by their connexion with our countrymen, and by too lavish presents at the first; while their little bursts of envy appear to have flowed from the same source. But the fair sex are charged with a strong propensity to slander and detraction, which were as busy among them as they sat in circles round the door mending their lines as in the most fashionable drawing-rooms. Their own conduct, meantime, is said to have afforded the most ample scope for censure, especially in regard to connubial fidelity; yet, when it is admitted that these faults were carefully concealed and much outward decorum observed, and that the propensity to calumny often led the natives beyond the strict limits of truth, we doubt whether too implicit reliance may not have been placed on the scandalous chronicle of the frozen regions. The natives certainly do appear to display a peculiar apathy in regard to the sufferings and even the death of neighbours and relations. Widows, and the aged and infirm, if they have not children of their own, experience the greatest indifference. In times of plenty, indeed, they share in the general abundance of food, but during scarcity a very small quantity reaches them; and, receiving no attendance in their sickness, they often perish through want and neglect. The children are treated with extreme tenderness; though the practice of adoption, which prevails most extensively, and establishes in full force between the parties the ties of father and child,

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is practised with regard to boys only, and seemingly in order that they may contribute to support the old age of their factitious parents.

The religious ideas of the Esquimaux, though they cannot be dignified with any better name than superstition, are not much more absurd than the popular creed of the ancient Greeks and Romans. Their principal deity is Aywillaiyoo, a female immensely tall, with only the left eye, wearing a pigtail reaching to her knee, so thick that it can scarcely be grasped by both hands. Captain Lyon witnessed a mighty incantation, in which Toolemak, the chief magician, summoned Aywillaiyoo to the upper world to utter her oracles. The party were assembled in a hut, where light after light was put out, till they were left in total darkness. The wizard then, after loud invocations, professed to descend to the world below to bring up the goddess. Soon there arose a low chant of peculiar sound, imagined to be the voice of Aywillaiyoo. During half an hour, in reply to the loud screams and questions of her votaries, she uttered dubious and mystical responses; after which the sound died away, and she was supposed to descend beneath the earth, when Toolemak, with a shout, announced his own return to the upper world. The performer, however, being soon after on board a British ship, was treated with nine glasses of hot water (brandy), under the influence of which he began to act over again his enchantments; when it appeared that, by varying modes of applying the hand or jacket to the mouth, he produced those changeful and mysterious sounds which had passed for the words of the goddess. This divinity has for her father a giant with one arm. The Esquimaux pantheon comprises, moreover, Pamiooli, a spirit frequently invoked, and a large bear, whose dwelling is in the middle of the ice, and who frequently holds converse with mankind. The natives believe also in a future world, the employments and pleasures of which, according to the usual creed of savage races, are all sensual. The soul descends beneath the earth into

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various abodes, the first of which partakes somewhat of the nature of purgatory; but the good spirits passing through it find the other mansions improve, till at a great depth they reach that of perfect bliss, where the sun never sets, and where, by the side of large lakes that never freeze, the deer roam in vast herds, and the seal and walrus always abound in the waters.

We now return to the progress of the expedition. The spring was singularly unfavourable. Captain Lyon attempted to penetrate across Melville Peninsula, but found the route so rugged and so barred by steep chains of mountains, that he was obliged to return in nineteen days without any discovery, except of two rapid rivers falling into the sea near Igloolik. Lieutenant Hoppner accompanied a party of Esquimaux to Cockburn Island, but could not make his way to any distance inland. It was the 7th of August before they were able, by severe sawing, to reach the open sea; by which time Captain Parry had renounced the hope of effecting any thing important during the short remnant of this season. He formed, however, a very bold plan; which was to bring all the stores of the other vessel on board the Fury, and with it alone to brave a third winter in the Polar regions, hoping that the succeeding summer might be more propitious. But, as he was preparing to carry this too daring project into effect, a report was made that symptoms of scurvy had broken out on several of the crew, whose physical strength appeared to be generally impaired by the two hard winters through which they had passed. This left no choice; and, in compliance with the general opinion of his officers, he forthwith began his voyage homewards. The ships were drifted about in a stormy sea covered with ice for twenty-four days; but, being at last favoured with a westerly breeze, they crossed the Atlantic, and on the 10th of October 1823 arrived in Brassa Sound, Shetland. After two successive years thus passed in the depths of the frozen world, whence not the faintest rumour of their existence had reached Britain, the officers and men were viewed

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almost as persons risen from the dead. The bells of Lerwick were rung, and other extraordinary demonstrations of joy made on their arrival. In a few days they entered the Thames.

Two attempts had thus been made, each to a certain point successful, but both arrested much short of the completion of the grand enterprise. The government at home, however, were not willing to stop short in their spirited career. The western extremity of Melville Island, and the Strait of the Fury and Hecla, appeared to be both so blocked up as to afford little hope; but Prince Regent's Inlet seemed more likely to lead to a prosperous issue. When explored during the recent voyage, it had indeed presented an icy barrier, but such as so often gave way suddenly and almost instantaneously, that the obstacles opposed by it early in the season could not be considered very alarming. A passage through this channel would bring the ships to the great sea bounding the northern coast of America, that had been seen from the strait mentioned above, and by which there was the fairest prospect of reaching, by the most direct route, the waters of the great Pacific. To follow up these views, Captain Parry was again fitted out in the Hecla; while, in the accidental absence of Captain Lyon, the Fury was intrusted to Lieutenant, now Captain Hoppner, who had taken an active part in the operations of the preceding voyage.

The expedition set sail from Northfleet on the 19th May 1824, and was in Davis' Strait by the middle of June. As the season, however, chanced to be peculiarly rigorous, it was not till the 10th September that, after repeated repulses and severe straining, they caught a view of the bold and magnificent shores of Lancaster Sound, in which a few solitary icebergs were floating. After this they thought themselves fortunate, when, by pushing their way through many miles of newly formed ice, they reached Port Bowen, in time to make it their winter-quarters.

The provision made for the physical well-being of

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the expedition during the cold season was still more complete than in the former voyages. The heat of the cabins was kept up to between 50 and 60 degrees, and the seamen wore next the skin a clothing of fur,—a substance which nature has endowed with a warmth far surpassing that of any human fabric. Yet the deep monotony produced by the uniform aspect of external nature, instead of becoming less sensible by habit, was only the more painfully felt. As the Arctic theatre had lost its attraction, Captain Hoppner started the idea of masquerades, which were, perhaps, still more out of keeping with the place and persons; but the sailors caught at it with pleasure, and on these occasions all of them acted their part with great spirit, and with the strictest decorum. The salutary and steady influence of the schools was again revived, and the whole crew gave their presence, either as teachers, scholars, or spectators.

The spring was unusually favourable, and, with comparatively easy sawing of the ice, the navigators warped out to sea on the 19th July 1825. As it appeared most desirable to coast southward along the western shore of the inlet, they stood across the bay, but were soon arrested by a continuous barrier of ice, which, however, left an open space on the opposite side. A fruitless attempt was now made to penetrate southward, the channel being found completely impeded; hence it was judged advisable, with the view of seeking a less-encumbered passage, to stretch to the northward. An adverse gale, by which they were overtaken near the mouth of the inlet, now drove them eastward; but at last they regained their course, and soon came in view of the bold face of the Leopold Isles, the rocks of which rise in horizontal strata of limestone to the height of 600 or 700 feet, resembling a huge and impregnable fortress.

Having touched at Cape Seppings, Captain Parry proceeded down the inlet, where he was no longer arrested by the unbroken barrier. The sea, however,

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was still heavily encumbered by numerous small fragments, that were tossing about in every direction, and pressed upon the ships so hard that the men wished for a contrary wind; which, coming from the south, would open and disperse the masses collected and driven against them by the north wind. In this anxious and precarious state they worked slowly on till the 1st August, when they reached the latitude of 72° 42′, longitude 91° 50′. Here the Fury received a most severe shock by a large floe, which forced her against the grounded ice of the shore; and tidings soon came to the Hecla that she had been very sharply *nipped*, and was admitting water copiously. The commander trusted that this would prove as harmless as the many shocks which this vessel had already endured; that the water made its entry by means of the twisted position into which she had been thrown; and that, when she was relieved from pressure, her leaks would close. But the next accounts were, that she could not be kept clear of water except by the action of four pumps, at which the whole crew, officers and men, were obliged to work. It became evident, that the evils under which she laboured could only be discovered and remedied by the operation of *heaving down*, by which her position being reversed, the parts now under water would be exposed to view. This expedient required a harbour, and there was none at hand; however, something was formed which resembled one, by connecting with anchors and bower-cables the grounded ice to the shore. Four days were then spent in unlading the Fury of those ample stores with which she had been provided. The operation was interrupted, too, by a violent storm of snow; while the external ice being driven in, demolished, in a great measure, the slender bulwarks by which the vessel was secured. Her holds were filled with water, and a minuter examination proved the damage of her hull to be still more serious than was at first apprehended. No means nor prospect appeared, either of saving her in her present situation, or of floating her to any known place of

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safety. In these circumstances, Captain Parry, without expressing any opinion of his own, called for a report from Captain Hoppner and his principal officers, all of whom agreed "that an absolute necessity existed for abandoning the Fury." Signals, therefore, were immediately made to the officers and men to carry their clothes and effects on board the Hecla. The stores, owing to want of room, were necessarily sacrificed along with the ship; and barrels of beef, beer, biscuit, and other valuable articles of provision, were left exposed on those savage and desolate shores, where they were then supposed unlikely to afford aid or benefit to any human being. After such a disaster, and the end of August having arrived, there was just time enough left to bring the Hecla home with a fair prospect of safety,—an object which was in due time accomplished.

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CHAPTER VIII.

Ross s Second Voyage.

Motives which led to the Expedition—Difficulties in equipping it—Expense defrayed by Sir Felix Booth—Accidents on the Coast of Scotland—Passage across the Ocean—Refitted at Holsteinborg—Passage through Barrow's Strait and down Regent's Inlet—Discovery of the Fury's Stores—Difficult Navigation—Winter Station in Felix Harbour—Means devised for resisting the Cold—Visit from a Party of Esquimaux—Information respecting the neighbouring Coasts—Expedition to Nei-tyel-le—To Shagavoke—To the Northward—For Cape Turnagain—Obliged to stop at Victory Point—Return—Attempt to sail next Summer—Arrested for the Winter—Excursion to the Northward—And across the Country—Commander Ross's Discovery of the Magnetic Pole—Another fruitless Attempt to bring home the Victory—Determination to abandon her—Summary of Observations on the Esquimaux—Journey along the Coast to Fury Beach—Fruitless Attempt to cross Barrow's Strait—Winter at Somerset House—Successful Navigation next Summer—Reach the Isabella of Hull—Reception—Return—Joy at their Arrival—Rewards to the Adventurers—General Results of the Voyage—Return of Captain Back.

So long a series of efforts, fruitless as to the ultimate object, and without the prospect of any decisive result, not only wearied out the perseverance of the British government, but combined with the severe spirit of economy, which began to pervade its councils, in inducing a determination not to send any more ships in quest of a north-west passage. Under this chilling influence, even the Board of Longitude was abolished,

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and likewise the reward of £20,000 offered by Parliament for the discovery which it was meant to promote. This somewhat premature removal of public patronage was however, in a great degree, compensated by the enthusiasm which had arisen in the nation itself. The bold enterprise of one individual, and the splendid munificence of another, led, after no long interval, to the equipment of an expedition, which, in point of interest, has equalled any that ever adventured into the Arctic seas.

Captain Ross was ambitious of resuming the undertaking which, in 1818, he had pursued with partial success; and it appeared to him that the invention of steam-sailing might be applied with benefit to this peculiar field of discovery. Vessels thus propelled could take advantage of all those openings in the sea, which are so often rendered innavigable from adverse gales; while the power of directing them, in opposition even to wind and tide, might be made available in avoiding a collision with formidable masses of ice. In soliciting, however, from different quarters, the means of fitting out a ship on this principle, repeated disappointments were experienced. Government declined the proposal on the grounds already stated. A merchant, whom Captain Ross endeavoured to tempt by the premium of £20,000, viewed it, not without reason, as a very precarious speculation. Mr (now Sir Felix) Booth, felt, on the contrary, so nice a sense of honour, that he would not embark in the enterprise so long as there could appear a possibility of his being swayed by any sordid motive. But when the parliamentary offer of £20,000 was withdrawn, the scruples of this high-minded individual were removed, and he generously engaged to furnish from his ample fortune the whole of what might be necessary for this grand adventure.

Captain Ross purchased the Victory steam-vessel, of 85 tons, which had for some time been employed between Liverpool and the Isle of Man. Additions were made which extended her to 150 tons; and two

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London artisans produced an engine on a new plan, which unfortunately, however, did not answer expectation. Provisions were laid in for a thousand days. The Admiralty, though they withheld all pecuniary aid, afforded the use of books and instruments, and even a decked vessel of sixteen tons that had been employed in the Polar expedition; also two boats formerly used by Captain Franklin. So great an interest was excited, that officers high in the navy tendered their services, and even offered to bear a share in the expense; but Captain Ross had already chosen for his second in command his nephew, who had been employed in every one of the recent northern voyages. The ship's company were twenty-two in number, including a purser, surgeon, and three mates.

On the 23d May 1829, the vessel, after being visited by the Lords of the Admiralty, by the present King of the French, and other eminent characters, was moved down the river. The steam-engine was soon found to be most miserably imperfect. At the utmost, it did not propel the vessel more than three miles an hour; and its action often required to be suspended altogether, in order to stop leaks and make necessary repairs. On the 7th June, however, they had reached the Mull of Galloway, when a dreadful accident occurred. William Hardy, the principal stoker, having lost his footing, one of his arms was entangled in the machinery, and so dreadfully shattered, that the captain, in the absence of the surgeon, who had not yet joined, was obliged to perform an immediate amputation, and treat it as he best could. The poor man was afterwards landed, conveyed to Stranraer, and placed under the care of a regular practitioner.

In hopes of remunerating Sir Felix Booth for his large outlay, the John of Greenock had been purchased, and fifty-four seamen engaged, with the view of carrying on the whale-fishery, and perhaps bringing back part of the Fury's stores. This crew joined at Port Logan, on the Scottish coast; but they proposed the

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unreasonable condition that, whatever the fortune of the fishery might be, they should be paid the same amount as if they came home with a full ship. As they persisted in this extravagant demand, and otherwise behaved in a manner extremely mutinous, it was judged necessary to relinquish this part of the plan altogether. The seamen of the Victory, who, in this crisis, conducted themselves admirably, were recompensed for the loss of their shares by an agreement to give them full pay according to their rating.

On the 13th June, Captain Ross steered his course through the North Channel, the wind being at first tolerably fair; but on the 14th, after passing the island of Rathlin, the vessel was assailed by so dreadful a tempest, that the top of the foremast gave way with a terrible crash, and only a few splinters kept it from falling into the sea. In crossing the ocean, they had a fair wind, and sailed without aid from steam. On the 1st July they descried, though at the distance of thirty-one leagues, a point of land, which they concluded to be Cape Farewell. On the 3d, they were off that southern extremity of Greenland, having already had served out to them their Arctic dresses. They now enjoyed so favourable a gale, that on the 6th and 7th they ran 278 miles, and reached the latitude of 61° 33′, where several large pieces of drift-wood were picked up, which proved extremely useful. On the 15th, they crossed the track pursued by the Isabella in 1818, and next day were in latitude 65° 34′. The wind becoming moderate and less favourable, they endeavoured to bring the engine into play; but it was so defective as to afford only very limited aid; besides that leaks and other damages were continually occurring, which were not repaired without much labour and difficulty. By the 22d, therefore, very little way had been made, though the opportunity was taken to employ themselves in catching fish, of which they obtained a large supply. An inlet being now discovered, Commander Ross was sent to examine whether it contained any good harbour; in which

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case it was determined to put in, and repair damages. The report was, that a cove had been found, perfectly safe, but so small that it would merely receive the ship. The bay, when entered, was seen to open into two magnificent inlets, bordered by rocks of imposing form; and every spot, not absolutely a precipice, was covered with such bright verdure as to justify the appellation of Greenland. In sailing upwards, the unexpected appearance of a Danish flag surprised the crew, and they learned that they were now near a settlement belonging to that nation, called Holsteinborg. The governor had seen the masts above the rocks, and, apprehensive of their being those of a vessel in distress, kindly sent an offer of aid. The party were immediately conducted to the village, where they got a hospitable reception, with entertainment such as they little expected on those dreary shores.

The settlement of Holsteinborg lies in 66° 58′ N. lat. and 53° 54′ W. long. The governor, named Kall, and the clergyman with his wife and family, are the only European inhabitants. The place consists of about forty huts; the church, which can contain two hundred persons, is well attended, the Danish sovereign displaying a laudable concern for the spiritual welfare of his Arctic subjects. The vicinity is, of course, devoid of trees, but abounds with angelica, scurvy-grass, and sorrel: and in the principal garden, salad, radishes, and turnips, are reared. The people are exclusively employed in hunting and fishing. About 3000 rein-deer skins, and a quantity of whale and seal oil, varying according to the fluctuations of the season, are annually exported to the mother-country.

A singular casualty had occurred here, which proved of great benefit to the expedition. The Rookwood whaler, from London, having struck on a rock near Woman's Islands, had put in to refit; but proving to be damaged beyond repair, she was abandoned, and now lying a complete wreck. A part of her stores had been sold to the Danes, and the remainder left in the custody

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of the governor, who took a great interest in the adventurers, and offered any thing belonging to the vessel which could be of service to them. Captain Ross thus found himself, as it were, in a dockyard. The mizzen of the Rookwood, without any trouble, was fitted in instead of his damaged foremast. The provisions were raised to their full complement, the owner being referred for payment to Sir Felix Booth. Some boots and gloves were obtained from the natives, and the governor made a useful present of six Esquimaux dogs.

On the 26th, the discoverers sailed to the northward; and on the morning of the 28th, the stupendous mountains of Disco Island, long enveloped in mist, burst on their view only a few miles distant. The range nearest the shore was entirely free from snow, and the interior hills were but partially covered. Hare Island was almost equally clear; and though forty icebergs were observed, yet, as the navigators approached the latitude of 74°, near to where the Hecla and Fury had been beset in 1824, not a vestige of ice was perceived. They might have fancied themselves sailing on the summer seas of England, or even of the Mediterranean: the men threw off their jackets, and worked in their shirts, without shoes or stockings. They had several times recourse to the engine; and though, from practical defects, it never enabled them to sail above a mile and a half an hour, yet as, without it, they could have made no way at all during these calms, the opinion in favour of steam-navigation in the Arctic ocean seems in principle confirmed. On the 6th August, a thick fog having dispersed, the coast was suddenly displayed, with all its high lands, among which Cape Byam Martin was conspicuous, covered with snow. On reaching the entrance of Lancaster Sound, and reverting to the blame imputed to him for not having explored it, the captain observes that, from the deceptive appearances presented by bays and inlets, similar mistakes had been made by Cook and other navigators of the greatest skill. No opinion differing from his had been expressed by any one of his

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officers, who, if they entertained any such, were unquestionably bound to have stated it. The ice, moreover, lay then so thick, that he could have penetrated but a few miles further. Now, however, he sailed through the middle of the strait, perceiving scarcely any trace of ice or snow, unless on the tops of the lofty mountains. The thermometer stood at 40°; while the sensible heat was so much greater, that they felt it agreeable to dine without a fire, and with half the skylight removed. For two days they made only a slow and laborious progress by the aid of steam; but on the 9th a welcome breeze sprung up from the east, and, all sail being set, on the 10th they passed Cape York, after which the land begins to turn southward, and, with the opposite coast of North Somerset (Boothia), forms the broad opening of Prince Regent's Inlet. This being the channel by which Captain Ross hoped to accomplish his passage, he immediately steered across, and reached the western shore on the afternoon of the 11th, between Cape Seppings and Elwin Bay.

In sailing southward along this coast some heavy gales were encountered; and the ice having been broken off in the various forms of streams, packs, and bergs, the full difficulties of Arctic navigation began to be experienced. These were increased by the near approach to the Magnetic Pole, so that the compass ceased to traverse; and the bearings could be ascertained only by observations on the sun, which was often obscured by heavy fogs. The navigators made their way, however, and on the 12th descried the place of the Fury's wreck, with the poles of the tents standing; but, to their mortification, a strong current carried them from the spot, and even out to sea. With great exertion they regained the coast, at what proved to be the opening of a very extensive bay, which was named Adelaide. They were then considerably beyond the desired point, and, with great efforts against wind and tide, came again in sight of the Fury's station.

They hastened, with intense interest, to examine this

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spot, on the state of which the success of the voyage and their very means of existence in some measure depended. The hull of the ship, which was left on the beach, had disappeared, without even a vestige remaining. The moving masses of ice had either carried it out in a body, or broken it into fragments, and scattered it as driftwood over the surrounding sea. But it was an ample compensation to find that the canisters of preserved provisions, after being exposed during four years, were in as perfect condition as if they had been newly prepared. The tightness of these vessels had prevented the bear from smelling the rich feast which they contained for him, and to which otherwise he would soon have forced his way. The wine, spirits, sugar, bread, flour, and cocoa, were, with little exception, equally good, and the sails were found in complete preservation. By an occurrence as singular as it was interesting, did they obtain, on this remote and desolate shore, a supply as abundant as if they had been lading at Wapping or Rotherhithe. After taking in all the provisions they could conveniently stow, raising their stock to two years and three months' supply, the accumulated pile seemed scarcely diminished. Here, also, they fortunately procured a store of coal.

Thus provided, they again set out on their career of discovery. Crossing the broad mouth of Cresswell Bay, they reached, on the 15th August, a cape to which the name of Garry has been attached, the farthest point seen by Captain Parry. The land now trended in a south-south-west direction, which, with few variations, it continued to follow. Deprived of all aid from the compass, and often enveloped in fogs, they worked their way slowly, amid many difficulties and frequent dangers, being obliged to steer merely according to the direction which the wind, or even the floating ice, had, in the last clear interval, been observed to pursue. While mountains of ice were tossing around them on every side, they were often forced to seek safety by mooring themselves to these formidable masses, and drifting with

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them, sometimes forward, sometimes backward. In this manner, on one occasion, no less than nineteen miles were lost in a few hours; at other times they underwent frequent and severe shocks, yet escaped any serious damage. Captain Ross draws a lively picture of what a vessel endures in sailing amid these moving hills. He reminds the reader that ice is stone, as solid as if it were granite; and he bids him "imagine these mountains hurled through a narrow strait by a rapid tide, meeting with the noise of thunder, breaking from each other's precipices huge fragments, or rending each other asunder, till, losing their former equilibrium, they fall over headlong, lifting the sea around in breakers, and whirling it in eddies. There is not a moment in which it can be conjectured what will happen in the next; there is not one which may not be the last. The attention is troubled to fix on any thing amid such confusion; still must it be alive, that it may seize on the single moment of help or escape which may occur. Yet with all this, and it is the hardest task of all, there is nothing to be acted,—no effort to be made,—he must be patient, as if he were unconcerned or careless, waiting, as he best can, for the fate, be what it may, which he cannot influence or avoid." He conceives, however, that his little bark, merely by its moderate draught of water, was much better fitted for such a navigation than the larger vessels employed in previous expeditions; and that those of Captain Parry would have been shattered to pieces by the rocks over which the Victory was carried in safety.

On several points of this coast they observed Esquimaux tents; at one place twenty in number, but none of the natives. Many whales appeared on the surface of the water close to them, without showing any apprehension of man; whence it is inferred that a rich harvest would be reaped by any vessel which should first venture upon these shores.

Among the leading features of the coast was Brentford Bay, of considerable extent, with some fine har-

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bours, thirty miles beyond Cape Garry. Here the captain landed, displayed his colours, and, drinking the king's health, took possession, in his majesty's name, of the land, to which he gave the name of Boothia. Port Logan proved a good harbour, but without any deep inlet. Far south of this, Elizabeth and Eclipse harbours, closely adjoining each other, were found to be extensive and commodious. Immediately beyond the latter appeared Mary Jones' Bay, large, but encumbered with ice.

Under all these impediments, in the course of August and September, he worked his way along 300 miles of undiscovered coast, and to within 280 miles of the point which Captain Franklin had reached. Here the land, taking a westerly direction, seemed to afford the fair promise of a passage between the country now surveyed and the continent of America. But by the end of September snow began to fall thick; the thermometer sunk far below the freezing-point; while ice in large masses was closing around them. They therefore considered themselves fortunate when, in a spacious bay between a rocky island and two icebergs, they found a station in Felix Harbour, in which, after due arrangements, they could reckon on passing the dreary season in security.

On the 7th October, by sawing through the ice, the vessel was placed in the position where it could be most advantageously lodged for the winter. On the 8th, there appeared no longer an atom of clear water; and, except some occasional points of rock, "nothing but one dazzling and monotonous, dull and wearisome extent of snow was visible." The temperature, which had been ranging between 10° and 22°, rapidly fell, and on the night of the 20th descended as low as 9° under zero, or 41° below the freezing-point, and before the end of the month was at minus 16°. Captain Ross makes some interesting observations on the power of the human frame to resist cold, which appears to vary remarkably in different constitutions. His general conclusion is, that

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the ruddy, elastic, florid, or clear-complexioned man, endowed with what physicians call the sanguine temperament, has a peculiar power of retaining heat; while those having pale, flabby, and sallow countenances, whose temperament is said to be phlegmatic, or melancholic, are very unfit for enduring the rigours of an Arctic winter. The most ample clothing will not compensate the deficiency, having power only to retain the internal heat; but if this be wanting, one might as well attempt "to warm a piece of ice by means of a blanket." He places his chief reliance on abundance of food, the failure of which would inevitably lead to starvation from cold. It is considered, therefore, a primary object to secure a full supply of the best victuals; and any restriction in this respect should be adopted only in cases of extreme necessity. The enormous quantity with which the Esquimaux cram themselves appears to conduce greatly to their endurance of cold,—an effect heightened by the peculiarly fat and oleaginous quality of their diet. The captain regrets that British seamen should give way to their natural antipathy to such food, which seems not insurmountable, since patients in hospitals, treated with fish-oil for the cure of rheumatism, often acquire an extreme fondness for it.

In preparing for the gloom and rigour of this long winter, he made some improvements even upon the admirable arrangements of Captain Parry. The vessel was previously cleared of the steam-engine, from which no farther benefit could be expected. All the crew saw with pleasure its last fragment removed, and valuable space thereby gained for stowage. The upper deck having been covered two feet and a half deep with snow, it was trodden down to the consistence of solid ice, and sand spread over it till it resembled a rolled gravel walk. It was then roofed with canvass, obtained from the spare sails of the Fury and Rookwood, which was conducted over the sides till it united with a bank of snow that had been formed around the vessel, thus completely fencing it in on every side. The vapour from the steam-

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kitchen and oven, instead of being allowed to spread through the cabins, was conveyed by apertures in the upper deck, over which were placed to receive it iron tanks, with the open side downwards, where it soon froze, and the ice was cleared out once a-week. By this plan the apartments were preserved perfectly dry, and it was not necessary, as formerly, to keep them up to the temperature of 70°, in order to prevent the vapour from freezing on their sides; that of 45° was found quite sufficient for health and comfort, and a great saving of fuel was in consequence effected. Two small ante-chambers were formed, and in the outer one such of the men as had been exposed to the atmosphere were required to leave the clothes on which snow had fallen. The air necessary to produce combustion was introduced by a copper pipe direct to the fireplace, where it was immediately warmed, and, instead of chilling, served to heat and dry the room. The strength and spirits of the crew were supported by regular meals and constant occupation. Divine service was duly performed, and religious instruction dispensed at a school held every Sunday evening. This was considered, not only to have a salutary effect on their general conduct, but in a particular manner to promote mutual union and harmony. On the other nights a school also was attended; and with such ardour did these gallant tars apply themselves to repair the deficiencies of their education, that it was a subject of regret to many of them when the termination of the long winter interrupted their studies.

The stock of provisions, on examination, was found sufficient for two years and ten months at full allowance, —a quantity which could easily be managed so as to last three years. Fuel was equally abundant. The only article deficient was spirits, of which there was only one year's full supply; but this want the commander by no means regretted, being satisfied that their habitual use impaired the strength of the seaman, diminished his power of enduring cold, and rendered him more liable to scurvy. He was gratified, therefore, when the crew

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cheerfully consented to their being withheld, unless on special occasions; and he considers this circumstance as having remarkably contributed to the preservation of their health. In fact, the end of the year arrived without any illness, except that of the armourer, who had imprudently engaged in the voyage while labouring under a fatal disease, which the climate might aggravate, but had no share in producing. The rest were in a good state, not only of health, but of spirits, having felt scarcely any weariness, although they had not sought to dispel it by light amusements.

The year 1830 opened with an incident which greatly enlivened the gloom of the succeeding winter. Traces of Esquimaux had been observed on different parts of the coast; but none had been hitherto seen. At length, on the morning of the 9th January, a party were discovered by a seaman from the observatory. Captain Ross immediately proceeded to the spot; upon which they retreated, but soon returned with a body of their companions, ranged in a line of ten in front and three deep, one man being detached, who appeared to be sitting in a sledge. The captain having sent for his nephew and some of the crew, desired them to remain behind, while he walked towards the Esquimaux, who were armed with spears and knives. He hailed them by the well-known national salutation, *Tima! tima!* which was shouted by them in return. The navigators then advanced, and throwing away their guns, called out, *Aja, tima!* upon which the others tossed their knives and spears in the air, repeating the shout, *Aja!* and extending their hands to show that they had now no weapons. As they stood still, however, the discoverers approached, and embraced all those in the front line, stroking their dress, and receiving in their turn this customary greeting. Their gratification was testified by laughing, clamour, and strange gestures; thus full confidence was at once established between the two parties.

These barbarians were found to be most comfortably

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clothed in a double covering of deer-skin, having the hair both within and without. They possessed knives pointed with iron, one of which bore the mark of English manufacture; and being prevailed on to enter the ship, they each received with the utmost delight the present of a piece of iron hoop. They did not manifest surprise at the vessel itself, nor at the wall of snow by which it was guarded, but were struck with astonishment on seeing themselves in a mirror, and at the engraved portraits of their countrymen from drawings made in former voyages. Some preserved meat of excellent quality was placed before them, which they began to eat, one of them even declaring it to be good; but, on being cross-questioned, he confessed that he had not spoken the truth. He was then permitted to lay it aside; and being regaled with oil, pronounced it to be "really good." The others, taking courage by his example, threw away also the offered treat, and betook themselves to their favourite mess.

Next day the discoverers visited this people at their own village, which consisted of twelve snow-huts, constructed in the very same manner as those observed by Captain Parry. This tribe were thought, on the whole, to be cleaner and better dressed than those more to the northward; besides, they kept a store of seal and reindeer buried in the snow,—a precaution not before noticed among any Esquimaux.

While the British remained on these shores, they held frequent intercourse with this and other parties of natives; and we shall endeavour afterwards to collect into one view their observations, so far as any new light is thrown on the habits and character of this remarkable race. It concerned the navigators more immediately to discover that this horde wandered as widely as those who occupied Melville Peninsula, and that they had equally in their peregrinations acquired a considerable extent of geographical knowledge. Some of the places about Repulse Bay being named and described, they showed an intimate acquaintance with them, stating

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that they had recently journeyed from that quarter. Two of them, Tulluahiu and Ikmallik, drew a sketch of the line of coast by which they had travelled, and this was amended by a learned lady, Tiriksiu. The general result proved to be, that between the present station and Repulse Bay there intervened a very extensive gulf, of which the limits were Melville Peninsula on the east, the American coast on the south, and the country in which they now were on the west. The grand question, whether there was any navigable opening farther westward, could not be then ascertained, though they had reason to believe that, if there was, it must be very narrow. The strongest interest, however, was excited by the accounts given by another party of a great sea lying to the westward, and of a strait which it was hoped might lead into it. On the 5th of April, therefore, when the rigour of winter had somewhat abated, Commander Ross, with Mr Blanky the chief mate, and two native guides, undertook an expedition to explore it. The weather being still very inclement, they were frequently obliged to pause and seek refuge from the drift, when the Esquimaux in half an hour erected snow-huts, which afforded tolerable shelter. Unluckily the fire necessary for heat and light, melting the walls of this frail tenement, enveloped them in moisture, to avoid which they were obliged to creep into their fur-bags. After a difficult journey of three days, they reached a bay facing the westward, and, on proceeding a short distance inland to the south and south-east, discovered a very extensive lake, called by the natives Nei-tyel-le, whence a broad river flowed into the bay. On their return to the coast the guides pointed out a lofty cape, beyond which there was said to be a vast sea, the termination of which could not be descried. They declared, however, that a tract of land, or isthmus, connecting the territory on which they stood with the continent of America, would render it impossible for the vessel to reach the western sea in this direction, or otherwise than by a channel considerably *north* of her present station.

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The journey so far had issued only in disappointment; but they learned that, on the coast nearest them, facing the eastward, there was a place called Shagavoke, where the water rushed through a narrow strait with extraordinary rapidity: hence arose hopes that this tide might come from the opposite sea, and afford a channel through which the ship could be worked. The natives, indeed, discouraged every such idea; but on a point so deeply affecting the principal object of the voyage, it was thought improper to rest satisfied with any thing short of ocular evidence. Commander Ross, therefore, on the morning of the 21st, set out with a fresh guide; and travelling, regardless of all inconvenience, fifty miles in the day, he reached the place before midnight. The channel at its entrance was about five miles broad, but four miles upwards it narrowed to 120 feet; and this small space was so encumbered with rocks, that it appeared doubtful if even a boat could effect a passage. The question proved of very little consequence, since, on tracing it farther, though the strait widened, it became ultimately a mere inlet, the rapidity of the current being derived from the large quantities of snow, by the melting of which it was fed. Every idea of a passage south of the ship's present station was renounced. On their return, a somewhat ludicrous incident occurred: the dogs ran off with the sledge over the rough ice, when the stores and instruments were scattered in every direction, the guide testifying his amusement by shouts of laughter.

It was to the north that all hopes of finding the desired passage were now directed. Some of the natives having mentioned a place in that quarter, whence they considered it possible to get round by sea to Nei-tyel-le, Commander Ross undertook a journey thither on the 27th of April, accompanied by Abernethy the mate and two native guides. After encountering many hardships, they discovered, on the 1st of May, from the top of a high hill, an inlet, which might possibly reach the western sea; but the numerous obstacles which inter-

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vened, and the exhausted state of the party, obliged them to return without ascertaining the point. Its aspect, however, was unpromising; and the most intelligent natives intimated that the only channel was in a much more northerly quarter, supposed to be no other than Barrow's Strait, through which Captain Parry had already navigated.

Before prosecuting further discoveries in this direction, another journey was resolved upon to the westward, beyond the isthmus, to trace the coast of America as it extended along the newly discovered sea. They thus hoped to reach Cape Turnagain, and to connect their discoveries with those of Captain Franklin. The younger Ross again set out on the 17th May, with three companions, eight dogs, and provisions for twenty-one days; and on the 19th, having crossed the great middle lake of the isthmus, he reached his former station on the western sea. The first view of it was celebrated by three loud and even joyous cheers, though tempered with regret at the diminished prospect of ever being able to navigate it. Having to spend the night here, they contrived a more comfortable sleeping-place, by excavating a sort of burrow in the snow, roofing it with their skin-boat, and placing a block of snow as a door.

After passing Cape Isabella, formed of gray granite 500 feet high, the party travelled along the coast west and north for twenty miles. On the morning of the 21st May, they discovered, behind a lofty point, an inlet, which, from its breadth and the different character of its opposite coasts, afforded the hope that it might open into the Polar ocean. They therefore made a complete circuit and a careful survey of its shores; but the only opening found was clearly ascertained to be the mouth of a river, named by them Garry. On ascending a high hill, they perceived several large lakes extending to the north-east, and forming in fact an almost continuous chain to Thom's Bay, near the Victory's station; with interruptions enough, however, to prevent a ship

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passing through. Next day they proceeded north-west along the coast; but resolving to reach the opposite land some miles distant, they crossed the frozen surface of the strait, and came to a large island, which was named Matty. They pursued their fatiguing journey along its northern shore, over rough ice; and passing another narrow strait, which they called Wellington, found themselves on the mainland of America. The coast now stretched due west, and the surface being level, they proceeded with comparative ease and rapidity. The direction changing to the north-west, they soon arrived at a spacious bay, which was named Parry; they then travelled onwards two days, but with difficulties continually increasing. One great embarrassment, as regarded both their advance and return, was how to distinguish between land and sea. "When all is ice, and all one dazzling mass of white,—when the surface of the sea itself is tossed up and fixed into rocks, while the land is, on the contrary, very often flat,—it is not always so easy a problem as it might seem on a superficial view, to determine a fact which appears in words to be extremely simple." The advancing season, instead of favouring the journey back, might render it very perilous, by converting ice into water, or at least into a soft and sinking mass. But the circumstance which most restricted their progress was the necessity of eating, for the suspension of which they could not forbear indulging some vain wishes. Their stock of provisions, however, not only imposed a limit on their excursion, but encumbered them with a heavy load, which the dogs could no longer assist in dragging. These animals, unable to travel without occasional days of rest, were now completely exhausted, and became themselves a burden. On the 27th, although the food had already been reduced below the full allowance, a still farther diminution was requisite, to render it possible for them to continue the journey two days longer. This, amid such heavy toil, was a very severe privation; yet,

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when the commander made the proposal, he found that the party had of themselves resolved to suggest it to him.

Having deposited every thing that could for the present be dispensed with, they set out on the 28th with only four days' provisions. On the 29th they reached Cape Felix, when the direction of the coast changed to south-west, and there was before them an expanse of ocean, which appeared altogether unbounded. Having travelled along it for twenty miles, their station next morning was in lat. 69° 46′ 19″, long. 98° 32′ 49″. They seemed in the direct route to Franklin's Cape Turnagain, which as many more days as they had already spent in their journey would have enabled them to reach; but for these days the very means of existence were wanting. They had brought with them from the ship provisions for only three weeks; much more than half was consumed, and they had but ten days' very short allowance for their journey back, which was not reckoned at less than 200 miles. They could not, therefore, have a moment's hesitation, though with intense regret and disappointment, to make this the boundary of their progress. The spot on which they stood was named Victory Point, while the most distant one in view, estimated to be in long. 99° 17′ 58″, was called Cape Franklin. At the former place they reared a cairn of stones six feet high, and lodged in it a narrative of their proceedings, though scarcely hoping that it would ever meet the eye of any European.

The return was attended with a considerable increase of suffering. The dogs fell victims to successive calamities, till, of eight, only two remained alive. It was proposed to vary the scene by keeping south of Matty Island, along the coast of the continent; but observing that it formed an extensive bay with winding shores, to follow the sinuosities of which would have consumed too much time, they pushed forward in a direct line over the frozen surface of the sea. On the 8th June, they arrived in a very exhausted state in the neighbourhood of Nei-tyel-le, where they met a party of natives,

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who received them hospitably, and supplied them so plentifully with fish, that they were able to take a day's rest, and proceed at leisure to the vessel, which they reached on the 13th.

Meantime, Captain Ross himself had made a journey, though of more limited extent, with the intention of surveying the isthmus of Boothia, when he made the partial discovery of another large lake, to which he gave the name of Lady Melville.

The nephew, upon his return, found that he had arrived just in time. The early spring, the only season when travelling is practicable in this region, was over. The thaw had set in with extraordinary rapidity; the country was under water; the streams impassable; and the surface of the ocean could not have been traversed without the greatest danger. Except a short excursion to procure fish, all their attention and efforts were directed to the extrication of the vessel with a view to her voyage northward, in which direction alone they could now hope to discover a passage to the western sea. But month after month rolled on; the height of summer passed, and the sea remained still bound in icy chains. In August its aspect began to present hopes, but these were followed by successive disappointments. Its close arrived, and they had the mortification to reflect that they had remained eleven months,— a period in which they might have circumnavigated the globe,— fixed to that dreary spot. At last, on the 17th of September, with a transport of joy, they found themselves free, and the ship, so long immovable, again buoyant on the waves. They advanced about three miles, when, encountering a ridge of ice, they made fast to one of its extremities, in a tolerably secure position between two bergs. Next morning, a change of wind and heavy fall of snow confined them to this precarious shelter; and in the evening a heavy gale sprung up, which, on the three following days, drove the icebergs, and the vessel along with them, to the vicinity of some rocks, causing considerable pressure,

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though no serious injury. On the 23d they were completely frozen in; and by the 30th the sea exhibited one unbroken surface. This state of things seems to have been chiefly produced by the northerly winds which prevailed during the autumn, particularly in September, and continually brought down fresh masses of ice. "It was as if the northern ocean were sending all its stores into this quarter;" and these were driven into the bays, and so closely wedged in by the tides, that they appeared as much a part of the coast as the rocks themselves. The greater part of October was employed in laboriously sawing their way through the ice, the thickness of which was always increasing; and they were at length obliged to desist after reaching a spot not exactly such as could be wished, but which, amid an ocean immovable on every side, afforded tolerable protection. Another dreary winter having now set in, it became necessary to look narrowly into the stock of provisions. A certain reduction in the daily allowance was found requisite, leaving, at the same time, enough to maintain the crew in health and vigour, which they continued to preserve uninterruptedly during the season. They felt, however, the utter monotony of their situation pressing upon them with increasing severity; they began almost to envy the Esquimaux, to whom eating and sleeping constituted the whole of existence. In this manner passed 1830; nor was it till April of the following year that excursions of any extent could be undertaken over the frozen surface of land and sea.

The first adventure of this kind was conducted by Commander Ross, who proceeded towards the north, with the view of examining the inlet formerly mentioned, which, from the report of some, they had been led to hope might reach between the two seas. Setting out on the 20th day of the month just specified, after a journey rendered severe by the drifting snows, he arrived on the 24th at the place, in about lat. 70° 38′ 32″. The first distinct view convinced him that it could not

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be that described by the Esquimaux, who had represented it as in some parts so broad, that from the one shore the opposite coast could not be discovered. He did not leave it, however, till, by a minute investigation, he had ascertained that it stretched only a small distance inland. There was still another opening at Brentford Bay, in lat. 71° 55′; but this as yet they had not examined, and he had not provisions enough for travelling to so distant a point.

On the 15th May the two principal officers set out together on another trip, crossing the country in the direction of the chain of lakes which had been observed from the inlet on the west coast. They passed along the river Lindsay, and also that of Saumarez, situated farther south; then a large lake, which they named Krusenstern after the eminent Russian navigator; next a smaller, with the appellation of which Captain Jekyll was complimented; and afterwards two others, to which the name of Professor Hanstein was assigned. The short intervals between these large sheets of water were filled by smaller ones, so that there was scarcely an interruption across the whole continent; though it is more than probable that there will never exist any motive to complete this natural communication. Taking a new direction, Captain Ross reached Cape Isabella, whence he returned, while his nephew proceeded along the western coast.

The discovery of the Magnetic Pole, which the observations of Captain Parry showed to be situated in this quarter, was one of the leading objects in the present voyage; there being every where a great desire to obtain all the light that could be thrown upon the mysterious agency by which vessels trace their path through the ocean. Calculations made by the learned in Europe had placed this interesting spot in lat. 70° north, and long. 98° 30′ west. Commander Ross, in his expedition of 1830 along the coast of America, when near Cape Felix, had approached within ten miles of it; but from the want of the necessary instruments, he

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was unable to make the requisite experiments. After his return to the vessel, however, a long and careful series of observations led him to the conclusion, that the above position had been erroneously assigned, and that the real point lies in lat. 70° 5′ 17″ north, and long. 96° 46′ 45″ west, which would place it on the western coast of Boothia. To this point, therefore, he directed his course. The journey was tedious and laborious, not only from the rigour of the season and the ruggedness of the surface, but from the care with which he examined every inlet and remarkable object. He set out on the 27th May, and on the 1st June, at eight in the morning, reached the spot to which his calculations referred. The instruments were the same day put in operation. The amount of the dip was 89° 59′, being only one minute less than 90°, the vertical position, which would have precisely indicated the polar station; and the horizontal needles, when suspended in the most delicate manner possible, did not show the slightest tendency to move. He looked, however, in vain for some object to mark so important a fact in physical science; for there was merely a low flat coast, rising about a mile inland into ridges fifty or sixty feet high. "Nature had here erected no monument to denote the spot which she had chosen as the centre of one of her great and dark powers." The commander, notwithstanding, placed upon it a flag, and to the locality has since been assigned the name of William IV.; he also erected a cairn of some magnitude, in which was lodged a record of his visit. The state of the provisions did not allow him to proceed more than a few miles farther along the coast, which he saw still extending ten or twelve miles in a continuous line due north. It was conjectured, though of course without any certainty, that it follows the same direction till at Cape Walker, in lat. 74° 15′, it joins the northern coast of the peninsula discovered by Captain Parry.

As soon as he returned, it was thought time, amid alternate hopes and fears, to watch the progress of the

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ice, and escape, if possible, from the prison of a third dreary winter. The season was not, on the whole, more favourable than that of 1830; yet, on the 28th August, a somewhat earlier period, they contrived to warp out into the open sea, and on the morning of the 29th were in full sail. Changes of wind prevented them from making more than four miles, and at evening the threatening aspect of the weather induced them to take shelter at the mouth of a small bay, which formed a secure harbour. They had cause to rejoice in having found this refuge, as a heavy gale came on, with a storm of snow; and next morning, from the top of a hill, they saw nothing but one heap of hummocky ice, which had completely blocked up their former harbour. They now anxiously watched an opportunity of getting themselves again afloat, and were occasionally cheered by a transient hope, which proved quickly fallacious. On the 14th of September they were little gratified to find that they could again take exercise by skating on the newly formed ice. On the 27th, the painful alternations of hope and disappointment were terminated, inasmuch as they found themselves completely fixed for a third winter. Their last year's navigation had been three miles; this season it was extended to four.

The spirits of the adventurers now began to droop in earnest. They soon became sensible that, at all events, it would be most perilous to wait another season in the hope of extricating the vessel, in which they could never return to England, and had no alternative but to abandon her amid the Arctic regions. Their only means of escape was to proceed in the boats, or draw them over the ice, to the wreck of the Fury, when, after supplying themselves with a fresh stock of provisions out of her stores, they might reach Davis' Straits, and return in one of the whale-ships. It was proposed, before abandoning the vessel, to place her in a situation where she might sink, and be drawn up by some future navigator. Observing that the preserved meats brought out in the Fury in 1823 remained, after the lapse of

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eight years, as perfect as at first, it was imagined that they would keep for a period altogether indefinite; and that possibly, after the lapse of centuries, another generation might from these specimens discover the style of cookery adopted in England at the present day.

About the end of November, considerable alarm was excited by symptoms of scurvy appearing in one of the crew. The extraordinary exemption hitherto enjoyed from this dreadful malady, in the absence of the grand specific of vegetable food, Captain Ross is inclined to ascribe to the abundance with which the men were supplied with water, notwithstanding the quantity of fuel requisite to melt the snow; to their never having been too long at once exposed to cold; and to the care that was taken not to allow them to remain in their wet clothes. Constant employment and exercise were also provided; and no little advantage is ascribed to the precautions against mental depression, and to the withholding of the usual allowance of ardent spirits.

As no further communication was henceforth held with the Esquimaux, we shall, before tracing the return of this adventurous crew, bring together the particulars observed by them respecting that people. It is unnecessary, indeed, to enter into much detail, as they are evidently the very same race observed by Captain Parry. Their snow-houses, their dogs, their mode of hunting and fishing, were precisely similar. In regard to food, they seem to have displayed a greater degree of foresight, having often large stocks in reserve; so that a ton of salmon was once purchased from them with articles which had cost only about 7s. 6d. Yet they manifested the same extraordinary appetite which had astonished a former expedition. On one occasion, a party of them were invited to what seems to have been considered only as a lunch; yet it amounted to fourteen pounds of raw salmon for each person. In this enormous eating, they sought, not merely to satisfy hunger, but also the gratification of their gross desire, making pauses to recruit their powers, and then beginning afresh.

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Commander Ross conceives that, with plenty before them, nothing will ever induce them to stop, except the absolute impossibility of forcing another morsel beyond the top of the throat. They retained the same distaste for European luxuries. When they found a store of rum and lemon-juice deposited for the use of the officer just named in one of his expeditions, they carefully emptied these liquors out of the vessels as "very dirty water."

The intercourse had not continued long, when instances of petty theft began to be discovered, consisting chiefly in their abstracting iron and glass articles,—a pair of snuffers, a hammer, and a reading-lens. The navigators soon found themselves possessed, in the eyes of the natives, of the power of conjuration, effected, as was supposed, by their scientific instruments, and still more by their arms; on the firing of which, it was immediately asked "what the guns had said." Of this impression they availed themselves somewhat too largely, in awing the people into confession and restitution. When detection took place, the thieves were derided by their neighbours, and considered as having the laugh against them, rather than as the objects of due censure. The same very slight degree of disgrace was incurred by the falsehoods in which they occasionally indulged.

Their matrimonial arrangements are more singular, and in some points more exceptionable, than could naturally have been expected. Convenience and interest seem the ruling motives. A widow left with a large family, and without property, is with us considered an object peculiarly helpless; but in Boothia she ranks as a great heiress, and is immediately surrounded by pressing suitors. The deeply felt obligation on the part of children to assist their parents, even by marriage, renders them a species of treasure, without which the former may, in old age, be reduced to extreme distress. More culpable accommodations are sometimes procured by polygamy, even in the form of two men having one wife, and by an exchange of wives, either permanent or temporary.

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On the whole, the conduct of the Esquimaux to their visiters was friendly, good humoured, and, when occasion required, even liberal. To this there was only one remarkable interruption. As Commander Ross, with two companions, was setting out on a journey, he approached an Esquimaux village; when, instead of the usual cheerful shouts, he was much surprised to be received in deep and gloomy silence. The women and children had been sent away, a usual prelude to combat, and the men were furiously brandishing their weapons. One old man, with the tears streaming down his cheeks, rushed out of a hut, and was about to throw at them the large knife used in attacking bears, when his arm was arrested by one of his sons. The natives, however, with a threatening aspect, attempted to surround the visiters, and their numbers rendered them formidable; but the levelling of a gun induced them to fall back. The two parties, nevertheless, maintained a hostile attitude, until one of the women rushed forward and disclosed the mystery. A fine boy, the adopted son of the enraged old man, had been killed the preceding night by the fall of a stone,—a catastrophe which the strangers were believed to have produced through the supernatural powers which they were supposed, and, as we have seen, had admitted themselves to possess. They now solemnly abjured those pretensions, which they had injudiciously advanced; and the people, being with much difficulty persuaded that they had no concern in the boy's death, made every effort to obliterate the impression caused by symptoms of anger proceeding from an imaginary cause.

The navigators, on taking a general view of their intercourse with these people, had the satisfaction to reflect, that they had supplied them with some useful tools and materials, and had even instructed them in the art of making nets, the value of which was fully appreciated, though it seemed doubtful if they would ever have the means of forming them on any adequate scale. An Esquimaux having lost his leg, a wooden

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one was constructed in its place,—a truly precious gift, by which he was converted from a helpless object to an active and efficient hunter. His gratitude was extreme; in testimony of which, he pressed the services of an eminent Angekok, to cure by conjuration the armourer, then in the last stage of illness; but this was too serious a case to admit of trifling. It was also a satisfactory reflection, that they had not taught them the use of spirits, had communicated no diseases, and had done nothing to make them discontented with the humble condition in which they were placed.

As already stated, the discoverers had abandoned every hope of returning home in the Victory; and they durst not even venture to await the period when her extrication might have been possible, as it would then have proved too late to attempt their journey over the ice. They therefore determined to move as early in the spring as travelling should be found practicable. The task was very laborious, as they had not only to proceed on foot, but to drag provisions and boats over a vast expanse of rugged ice. The only thing which rendered the undertaking hopeful, was the prospect of finding on Fury Beach an ample store of boats and provisions; though this spot was distant 180 miles in a direct line, which, by the necessary windings, would be extended to 300. The plan was, first to carry forward the boats and a portion of food a certain length, depositing the former in a convenient position, in the event of its becoming necessary to fall back upon them. The party were then to push forward to the wreck, and ascertain whether the valuable supplies which had been left were still to be found.

On the 23d April 1832 they set out on the first part of their expedition. The loads being too heavy to be carried at once, made it necessary to go back and forward twice, and even oftener, the same day. They had to encounter dreadful tempests of snow and drift, and to make circuits in order to avoid impassable barriers. The general result was, that, by the 21st May, they had

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travelled 329 miles to gain 30 in a direct line, having in this labour expended a month.

After this preliminary movement, they returned to the ship, of which they were soon to take a final leave. On the 29th May they hoisted the colours, nailed them to the mast, and drank a parting glass to the Victory, which they considered worthy of a better fate. Captain Ross describes himself as deeply affected; this being the first vessel he had been obliged to abandon, of thirty-six in which he had served, during the course of forty-two years. In a few days they reached their former deposit; and the men, extremely exhausted, were anxious to leave the boats and spare provisions and push on to Fury Beach. The captain, however, considered it indispensable to carry these to the other side of Elizabeth Harbour, as the nearest spot to which there was full security of being able to return. The 9th June arrived before every thing was brought forward to that point: it was soon after arranged, that his nephew and two others should set forward as a light party, with a fortnight's provisions, to ascertain the state of the supplies, and then return with their report to the main body, who were to proceed by slower marches, but more heavily loaded.

On this laborious journey Captain Ross had an opportunity of examining the coast, and ascertaining that the large inlet in Brentford Bay was formed merely by a river, and could afford no passage to the western sea. On the 25th June he met the advanced party, who reported that they had found three of the boats washed away, but enough still left for their purpose, and all the provisions in good condition. On the 1st July the whole crew reached their destination. They immediately enjoyed a hearty meal, and soon reared a canvass mansion, which they named Somerset House.

The month of July was spent in fitting out the boats, which were ready by the 1st of August, when there appeared a considerable extent of open sea, cheering them with the hope of being able to penetrate through Bar-

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row's Strait into Baffin's Bay. The voyage, however, proved very difficult; masses of ice, still tossing amid the waves, placed them sometimes in dangerous positions; and when they sought shelter on the beach, it was mostly bordered by lofty precipitous cliffs, from which, at this season of thaw, fragments were often detached, one of which might have crushed them to pieces. It was the 29th August before they passed Cape Seppings, and arrived at the junction between Prince Regent's Inlet and Barrow's Strait. After several attempts to run along the latter, rendered fruitless by the ice, they were obliged to haul the boats on shore and pitch their tents. There was still time to have accomplished their object; but repeated surveys from the neighbouring mountains convinced them that Barrow's Strait was now, and had been during the whole summer, an impenetrable mass. By the 24th September all were agreed that no choice was left but to return to Fury Beach, and there spend their fourth Arctic winter. Proceeding therefore in the boats, on the 30th September they reached Batty Bay, more than half the distance; but the ice rendering it impossible to sail farther, they hauled them on shore, and left them above high-water mark. Then, carrying the provisions on sledges, and making a somewhat difficult journey, they arrived on the 7th October at what they now accounted their home.

The party suffered at first a good deal from cold, against which their canvass covering afforded very imperfect shelter. They contrived, however, to envelop it in a wall of snow, and set up an additional stove, which was so effectual, that the heat of 51° could be maintained within. It was necessary to make a reduction in the allowance of preserved meats; bread was somewhat deficient; and the stock of wine and spirits was entirely exhausted. However, as they had caught a few foxes, which were considered a delicacy, and there was plenty of flour, sugar, soups, and vegetables, a diet could be easily arranged sufficient to maintain the party in health and vigour.

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The winter, as it advanced, proved one of great severity; and when the cold reached its utmost rigour, their slight walls could no longer keep the mansion in a comfortable heat. The tempestuous weather made it impossible to take exercise in the open air; and at length their patience appears to have been wearied out by this long and dreary imprisonment within the Arctic wastes. On the 16th February 1833, Thomas, the carpenter, died of scurvy,—an event deeply regretted in itself, and regarded as a warning of what was too likely to befall the rest. Several of the seamen, in fact, became affected with this cruel disease, of which Captain Ross himself felt the sure approach by the return of pain in his old wounds. Their situation was becoming truly awful; since, if they were not liberated in the ensuing summer, little prospect appeared of their surviving another year.

In April and May, as soon as it was possible to travel, while yet the ice remained firm, it was necessary to carry forward an ample stock of provisions to the position of the boats, and there wait the opportunities of release. Though the distance was only 32 miles, their reduced numbers, and the weight of the loads, obliged them to go over the same ground eight times, raising the space actually traversed to 256 miles; so that it afforded laborious employment for a whole month. They then returned to Somerset House, where they remained till the 8th of July; on which day the whole party quitted, without regret, this dreary home, and, though much encumbered by the transport of the sick, arrived on the 12th at their boat-station in Batty Bay.

The aspect of the sea was now watched with intense anxiety, not unmingled with dread; yet the very habit of observing and of speculating on their prospects,—some daily mounting the neighbouring hill, and others reviewing their report,—kept their spirits in a state of salutary activity. The pursuit of feathered game, which always afforded the hope, and sometimes the reality, of a good supper, also enlivened their time. A month was passed in vain expectation; when at length, on the

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evening of the 14th August, a lane of water appeared leading to the northward. Next morning the seamen were in movement at an early hour; and, having cleared the shore of the ice that obstructed it, they embarked the provisions and stores, and by eight o'clock were under weigh, with a favourable wind. At midnight they passed Elwin's Bay, and on the 16th had come to the farthest point reached in the preceding year,—a spot which excited some painful recollections. However, though all passage to the east was closed, there was still an open lane by which they could proceed northwards. In the evening of that day, they were at the north-eastern point of America, and beheld the sea in that direction quite navigable, though encumbered with ice. At three in the morning of the 17th, they were in motion, making their way through the loose pieces, till, favoured by a southern breeze, they turned the point of the solid mass which obstructed the inlet, and saw the wide expanse of Barrow's Strait open before them. Wafted on as if by magic, they reached the opposite shore, which they sailed along to within twelve miles of Cape York, having made in this day seventy-two miles. In the two following they passed Admiralty Inlet, and came within six or seven miles of that called Navy Board; after which they were detained four days by contrary winds, and obliged to reduce their allowance of provisions. On the 25th, however, they could again use their oars, and reached the eastern side of Navy Board Inlet, where they found a good harbour for the night.

At four in the morning of the 26th, they were roused from sleep by the look-out-man announcing "a sail," which, viewed through a glass, proved evidently to be a ship. All were presently in motion, and their hopes and fears were variously expressed. But they were detained by calms and light shifting airs; and, a breeze springing up, the vessel made sail with a rapidity which left them hopelessly behind. About ten, however, they descried another, which seemed to be lying-to; but she,

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also, soon bore up under all sail, and appeared to be fast leaving them. Happily a calm succeeded, and, by hard rowing, they approached so near that their signals were perceived, when she was seen to heave to and lower a boat, which made directly towards them. On its arrival, the mate in command asked if they were in distress and had lost their vessel, proffering his aid; stating, in answer to their inquiries, that he belonged to the Isabella of Hull, once commanded by Captain Ross, now by Captain Humphreys. On being told that the former person stood before him, his brain was so puzzled that he declared the captain must be under a mistake, as he had certainly been dead two years. When satisfied, however, of the contrary, and that he was in the presence of the long-absent navigator, he offered his hearty congratulations, and hastened back to the ship with the gratifying intelligence. Immediately the yards were manned, and the adventurers were saluted with three loud cheers. The scene on their arrival may be much more easily conceived than described. "Every man was hungry, and was to be fed; all were ragged, and were to be clothed; there was not one to whom washing was not indispensable, nor one whom his beard did not deprive of all English semblance,—it was washing, dressing, shaving, eating, all intermingled." Then "interminable questions to be asked and answered,"—all the adventures of the Victory, all the English news of four years. At length they were accommodated with every thing, and retired to rest; "and I trust," adds Captain Ross, "there was not one man among us who did not then express, where it was due, his gratitude for that interposition which had raised us all from a despair which none could now forget, and had brought us from the very borders of a not distant grave to life, and friends, and civilisation." Such, however, was the effect of previous hardship, that few of them could sleep on a bed; and some time was necessary to enable them to enjoy this and other accommodations of ordinary life.

Captain Humphreys had sailed up Barrow's Strait in

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search of the Victory, and even attempted to cross Prince Regent's Inlet; but he had been arrested by a field of ice, and was now returning. Having only two-thirds of a cargo, he was obliged to remain for some time in Baffin's Bay. On the 13th September they fell in with the fleet of whalers on the fishing-ground, when all of the captains came on board to welcome the discoverers, and some of them brought presents from their own stores, which were very acceptable. On the 30th September the fishery being no longer practicable, the Isabella left Davis' Straits, and on the 12th October reached Stromness in Orkney. The intelligence respecting the adventurous individuals she had on board spread thence like lightning through the kingdom; for never had any event connected with maritime enterprise, at least in our day, produced so strong a sensation. With the fourth winter hope was almost extinguished in the breasts even of the most sanguine; and Captain Ross with his companions, having been numbered among the many victims who have fallen in this hazardous career, were received now as men risen from the grave. On his landing at Hull, on the 18th, such crowds were attracted that he could with difficulty reach the inn. After receiving the freedom of the town, and a public entertainment, he proceeded next day to London, and having reported himself to the Admiralty, was presented on the morrow to his majesty at Windsor, from whom he experienced a most gracious reception.

To this meritorious body of men the public were fully disposed to make a liberal remuneration for their toils and dangers; and government to a certain degree was inclined to second their dispositions. Although no obligations had been incurred, the inferior officers and seamen received double pay from the period of their departure to the time of their leaving the ship, and full pay from that date till their arrival in England. Those who desired, and were qualified, obtained employment and promotion. Commander Ross was insured, after the necessary preparation of another year's service, of being

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raised to the rank of post-captain. The surgeon, the gunner, and the purser, were appointed to eligible situations in the navy. Captain Ross alone, apparently from an excess of the laudable spirit of economy, was refused every thing, except the half-pay which had accumulated during his absence, and to which he would have been equally entitled had he remained at home. He had therefore ample ground for an appeal to Parliament; and, in April 1834, a committee of the House of Commons decided, that, considering the importance of the object, and all the circumstances attendant on the expedition, they would not transgress the bounds of a prudent liberality by recommending that the sum of £5000 should be voted to him.

In taking a general view of this voyage, we do not consider it as within our province to notice any defects which might perhaps be detected in the narrative or chart, but shall simply remark that it has not been unproductive of very important discoveries. Additional doubts have indeed been thereby thrown on the existence, or at least the practicability of a north-west passage. The channel which had for some time been considered as offering the best ground for hope, has been found obstructed by the extensive territory of Boothia, which, though not as supposed by him a peninsula, is separated from the continent only by passages probably of difficult navigation. There remains only the strait to the south of the Georgian Islands, which Captain Parry, in two successive seasons, attempted without success. The two other courses mentioned by Captain Beaufort, in his evidence before a select committee of the House of Commons, the one northward through the Wellington Channel, the other south-west from Leopold Island, appear to us to offer very slender promise. An increased probability is however presented, that a vessel which should, in some favourable season, penetrate southward between Banks' Land and Cape Walker, the apparent extremity of Boothia, would find an open and unobstructed navigation to Behring's Strait. However this

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may be, the actual coast discovered by Captain Ross was considerable and important. The northern termination of the American continent is the last of the great boundaries of the earth which has been left for modern enterprise to explore, and to this interesting object he made some important contributions. Even the survey and description of this large insular tract forms a considerable accession to geography. The value of his magnetic observations, too, has been highly appreciated by Professor Barlow, so eminent in this department of science, by Captain Beaufort, and by Mr Children.

During the deep though desponding interest felt for Captain Ross's expedition, a number of spirited individuals raised a subscription, which, aided by £2000 from government, enabled them to send out Captain Back,—the active companion of Captain Franklin,—to trace, if possible, the fate of the Victory. After his departure, the long-absent navigator returned home; but, before the tidings could be conveyed to Captain Back, he had landed at New York, and reached the northern lakes. Having, therefore, gone so far, he was instructed to proceed, and undertake the exploration of that small portion of the American coast which intervened between the farthest points reached by Ross on the one side and Franklin on the other. In this career he discovered a new river, the Thlew-ee-choh, on which he embarked, with the assurance that it would carry him down to the sea. After overcoming various hardships and difficulties, he succeeded in reaching its termination, and entered a large bay of the northern ocean. He traced the whole circuit of its shores, and even obtained views of the coast both to the east and west. He did not, however, reach Sir James Ross's pillar, and thus could not connect his own discoveries with those of his predecessor. There only appeared reason to believe, on comparing the two, that Boothia, instead of a very extensive peninsula, was in reality an island, separated by a channel from the body of America. On the whole, Captain Back's journey being performed by land or in boats, is foreign to our present

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subject, and belongs properly to the continent. Accordingly it has been narrated at some length in the volumes of the series which relate to British America.*

In 1837 and 1838, expeditions were undertaken, under the direction of the Hudson's Bay Company, by Messrs Dease and Simpson, by whom a good deal of farther information was collected. These journeys, however, were carried on similarly to that of Captain Back, and solely with the view of exploring the boundaries of the continental coast. The leading particulars therefore have been narrated in the work already referred to.† No recent attempt has been made by a maritime expedition to penetrate through these seas. Rumour, however, states, that a fresh one is at present in contemplation, to be conducted by Sir James Ross, now returned from his important discoveries in the Antarctic seas.

* Vol. iii. chap. ii.
† Ibid. vol. iii. page 77. Appendix, pages 355, 372, &c.

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CHAPTER IX.

Recent Voyages towards the North Pole.

Expedition of Captain Phipps (Lord Mulgrave); Progress arrested by the Ice; His Return—Scoresby; Various important Observations made by him; Voyage to the Eastern Coast of Greenland; Discoveries; Returns to England—Clavering's Voyage and Discoveries—Expedition of Grash—De Blosseville—Dutaillis—Buchan's Expedition—Parry's Fourth Expedition, in which he attempts to reach the Pole; Progress along the Coast of Spitzbergen; The Boats arrive at the Ice; Mode of Travelling; Various Obstacles encountered; Compelled to return—Question as to the Practicability of reaching the Pole.

Since the times of Hudson and Fotherby, comprehending a period of more than a century, the attempt to reach and to cross the North Pole had not been resumed. The extraordinary zeal, however, which in the early part of the reign of George III., and under the patronage of that excellent monarch, was kindled in the cause of naval discovery, failed not to extend in this direction. Mr. Daines Barrington, distinguished by the union of rank with scientific acquirements, espoused with ardour the belief that, in spite of every obstacle, the pole of the earth might be reached, and various facts thereby brought to light, which at present are hid in mystery. He read to the Royal Society several papers on this subject, which were afterwards reduced into a separate treatise; and that learned body, eagerly imbibing the opinions of their eminent associate, solicited the Board of Admiralty to fit out an expedition which might

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attempt to realize this interesting object. The Earl of Sandwich, then at the head of the naval department, entered with ardour into the society's views, and drew up the plan of an expedition, which he submitted to his majesty. The intentions of government having now transpired, Captain John Phipps, afterwards Lord Mulgrave, offered himself for the command, and was accepted. Two bomb-vessels, known under the rather odd names of the Racehorse and the Carcass, were selected, and stored with an ample provision of wine, spirits, and whatever else could contribute to the health and comfort of the crews; the latter of which was intrusted to Lieutenant Lutwidge, under whom Horatio Nelson, afterwards so celebrated in the naval annals of Britain, served as cockswain. Other equipments were added, not hitherto customary in nautical preparations. All previous attempts were made by mercantile bodies, who were content to combine geographical discovery with certain views of commercial advantage; whereas the expeditions projected under the auspices of George III. were the first which had the promotion of science for their sole object. Mr Israel Lyons, an eminent astronomical observer, was employed by the Board of Longitude to supply the ships with suitable instruments; to which were added two chronometers, made with the greatest care by Kendall and Arnold, for measuring the distance from the first meridian by difference of time. Mr Cumming constructed a seconds-pendulum, fitted to determine the range of vibration in high latitudes; while Sir Joseph Banks and M. d'Alembert drew up instructions suggesting various scientific objects, respecting which it was thought desirable that observations should be repeated. The vessels were also provided with Dr Irving's apparatus for distilling fresh water from the sea,—an invention which, being then recent, excited much interest.

Thus equipped, the expedition began to move on the 21st May 1773; but being detained by contrary winds, did not leave the Nore till the 4th June. The last

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object seen on land was Whitby Abbey; and Captain Phipps then steered into the mid-channel of the German Ocean, endeavouring to avoid both Norway and Shetland. In sixty degrees of latitude the sun set about twenty minutes past nine; the clouds making a beautiful appearance by the reflection of its rays when below the horizon. In latitude 66°, on the 19th June, that luminary, even at midnight, was still visible. Captain Phipps here made deeper soundings than were ever before attempted; reaching with a very heavy lead not less than 780 fathoms. The temperature at that depth was 26° Fahrenheit, while in the air it was 48°. Trial was now made of Dr Irving's apparatus, which was considered completely successful; inasmuch as it was found to produce a sufficient quantity of perfectly good water, either for drinking or cooking, without any inconvenient expense of fuel. This favourable opinion has not been confirmed by experience; and the practice, owing, we believe, to the quantity of coal required, has never come into general use.

On the 27th June the navigators found themselves in the latitude of the southern extremity of Spitzbergen, without any appearance either of ice or land; but two days after they saw the shore, and stood close in. This coast "appeared to be neither habitable nor accessible; for it was formed by high barren black rocks, without the least mark of vegetation; in many places bare and pointed; in other parts covered with snow, appearing even above the clouds: the valleys between the high cliffs were filled with snow and ice. The prospect would have suggested the idea of perpetual winter, had not the mildness of the weather, the smooth water, bright sunshine, and constant daylight, given a cheerfulness and novelty to the whole of this striking and romantic scene." In sailing along this bold and lofty coast, the mariners enjoyed gentle gales and measured the height of several of the mountains, one of which was found to be 4500 feet. On the following morning they learned, from the master of a Greenlandman, that there was ice

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sixteen leagues to the westward, and that one Dutch and two English ships had been lost in the course of the season.

In the first days of July, Captain Phipps continued to steer along the shore; and on the 4th he came to Magdalena Hoek, near which he landed, and began to make observations upon the variation of the compass, which were soon interrupted by a thick fog. Being informed by the Rockingham, a vessel employed in the fishery, that the ice was ten leagues off Hakluyt's Headland, he determined to direct his course for that part of Spitzbergen. On the 5th, as he was avoiding certain islands near Danes Gat, something white was seen through the mist, and a noise was heard as of surf breaking upon the shore. The commander, desiring the Carcass to keep close to him, resolved to stand towards it and see what it was. Erelong, amid thick fog, the crews saw an object on their bow, partly black and partly covered with snow, which they at first mistook for land: it soon, however, proved to be the main body of the ice, on which wind and sea were beating with such violence that they could not have escaped, except by constant change of tack, and by the utmost alertness of officers and men.

Captain Phipps, finding himself now upon the great field, and being informed that it extended unbroken to the north-west, determined to move eastward,—a direction seldom taken by the whale-fishers,—where he hoped to find some opening to them unknown. Continuing to work his way against the wind, between the ice and the land, he passed first Hakluyt's Headland, then Vogel Sang, and on the 7th found himself approaching the bold pinnacle of Cloven Cliff,—a remarkable promontory, named from its resemblance to a cloven hoof, and which, from its perpendicular form, is never covered with snow. Here, as the frozen masses increased in number and size, the officers, after full deliberation, concluded it vain to attempt penetrating any farther in this direction; and they were farther

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discouraged, by considering that this was nearly the place in which all previous navigators had been checked in their efforts to reach the Pole. The commander therefore came to the resolution of standing to the westward, cherishing some hopes of a passage in that course. He had a dreary run, immersed in fogs so thick that the ships, even when very near, could not see each other; and a number of the crew, notwithstanding an extra allowance of wine and spirits, became affected with rheumatic colds and pains in the bones. Having made ten degrees to the westward, without the least appearance of an opening, he determined again to try the east, in the hope that the continuance of warm weather might have dissolved the barriers which had formerly arrested his progress. On the 12th July the navigators were a second time in the vicinity of Cloven Cliff, and found a good harbour on the island to which it is attached by a narrow isthmus. Here they obtained abundance of water, and, though interrupted by fog, made some important celestial observations,—taking the bearings and altitudes of the principal objects on the coast. In endeavouring to push on, however, the captain was stopped at nearly the same point as before,—finding the ice locked in with the land, and no passage either to the east or north. In despair, he turned once more westward, and kept close to the main field, pushing into all its openings, some of which, being nearly two leagues long, afforded hopes of success; but they proved to be only ice-bays. Near Hakluyt's Headland the ships suffered a severe pressure between a loose fragment and the fixed mass. He now perceived that it would be extremely unsafe to proceed before an easterly breeze, which brought in all the loose pieces, and drove them against the great field, making it resemble a rocky shore; and it proved both easier and safer to sail against the wind. He resolved, in spite of repeated repulses, to try another effort to the eastward; and this time he was rewarded by some progress. Making way through

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the floating ice, he came to an open sea, stretching north-east, which inspired the most flattering hopes. The coast was neither so lofty nor exhibited the same monotonous aspect as the one he had just passed; the tints being more varied, and having more of the natural colour of earth, had caused the early navigators to give to different points the names of Red Beach, Red Hill, and Red Cliff. At length he reached Moffen, a low flat island, covered with numerous flocks of wild fowl. He continued two days longer to sail through an open sea, meeting only loose masses, till, on the 27th, he was stopped by the main body of the ice lying east and west. He then coasted it to the eastward, pushing the ship, by a press of canvass, into the icy bays or openings, notwithstanding the large pieces by which these were encumbered. On the 29th July the expedition reached another island, larger than Moffen, clothed with moss, and well supplied with deer; on the shore of which were found large fir-trees, some seventy feet long, partly torn up by the roots, partly cut down by the axe, and fashioned into different shapes, but all perfectly entire. Two of the officers engaged in an encounter with a walrus, from which they came off with little honour. The animal being alone, was wounded in the first instance; but, plunging into the deep, he obtained a reinforcement of his fellows, who made a united attack upon the boat, wrested an oar from one of the men, and had nearly overset her, when another boat from the Carcass, under the command of Nelson, came to her relief.

From the point which the discoverers had now reached, they saw that remote peninsula of Spitzbergen which the Dutch call North-east-land, and beyond it the range of the Seven Islands. The ice, however, began to gather round them, and Captain Lutwidge, on ascending to the top of a high hill, saw to the eastward one continued frozen surface, bounded only by the horizon. The ships were now becalmed amid a very beautiful and picturesque scene; the immense

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field being covered with snow, except where some pools of water were coated with a newly formed crust. The mariners attempted in vain to make any progress; the ice closed fast, and no opening was any where seen, except for about a mile and a half round the vessels. The pilots, who had never before proceeded so far, were seriously alarmed lest they should be beset. Nor were their fears groundless; for next day the ships were frozen in faster than ever, not having room to turn, while the passage by which they entered had entirely closed up behind them. There was no longer any time for deliberation. They began sawing through deep ice, some of which was twelve feet thick; and these laborious efforts only enabled them to move three hundred yards westward; while the mass by which they were invested was moving in the opposite direction, carrying them along with it. In these circumstances, Captain Phipps conceived no time was to be lost in putting out the boats and dragging them over the surface, with the view of reaching the Dutch fishermen who usually about this period were known to shape their course homewards. On the 7th August they had got forward two miles; and the commander, on his returning to the ships, finding the ice round them a little more open, caused all the sails to be set, by which means they were made to move, though but slowly, and still counteracted by the drift ice. However, being favoured by moist and foggy weather, their progress soon became more rapid. They came up with the boats, and took them on board; and on the 10th, having a brisk gale from the north-east, they forced their way through all obstacles, though not without sustaining many heavy strokes, and breaking the shank of their best bower anchor; but about noon they found themselves in the open sea.

Being thus delivered from their greatest fear, they repaired to the harbour of Smeerenberg for refreshment. In its vicinity they admired a very lofty iceberg, which presented a perpendicular face nearly 300 feet high, of

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a fine light green, and down which a cascade was pouring. "The black mountains, white snow, and beautiful colour of the ice, made a very romantic and uncommon picture." A large fragment, which had fallen into the sea, floated out, and grounded in twenty-four fathoms: it stood fifty feet in height, and was of the same beautiful tint.

Captain Phipps, before quitting the Polar world, made some general remarks on the phenomena which it presents. In all cases he observed a great swell near the edge of the ice; but, whenever he was enclosed among its loose fragments, the sea was perfectly smooth. According to Hudson, the green waters were free from ice, which was found only in the blue; but no facts appeared to confirm this distinction, nor does there probably exist any. Marten described the sun at midnight as resembling the moon in appearance; but our observers could see no difference in its aspect, except what arose from its being lower in the heavens.

On the 19th August, the captain weighed for England, and on the 24th was somewhat surprised by the sight of the planet Jupiter, no star having for a long time been visible amid the perpetual light of the northern sky. After passing Shetland on the 7th September, he sustained several very heavy gales, during which he lost three boats, and was obliged to throw two guns overboard. However, having reached Orfordness on the 24th, he proceeded without farther difficulty to the Nore.

The result of this voyage, which was considered as having been made under favourable circumstances, tended in some degree to chill the hopes of penetrating more deeply into the Arctic regions. It seemed that, from the eightieth degree, ice in one unbroken field stretched to the Pole. The probability, however, of attaining the desired object by sailing northwards from the Pacific, between America and Asia, led to the equipment of Captain Cook for his third voyage. After that attempt had also failed, disappointment was followed as

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usual by a suspension of interest; and the northern realms sunk almost into an entire oblivion down to the recent period when the spirit of discovery was again revived. Public attention was first recalled to them by Mr Scoresby, who, bred a practical whale-fisher, had made observations with an intelligent and scientific eye, very unusual among those who pursue a calling so rough and dangerous.

In 1806, this gentleman made the nearest approach to the Pole that had as yet been fully authenticated; for the statements of the Dutch and other navigators, who boast of having proceeded farther, are subject to great doubt as to their observations of latitude. At this time he was acting as mate to his father, who commanded a Greenland ship from Hull. Having left Jan Mayen and the Whale Bight, they pushed northwards, when they reached an open sea, so extensive that its termination could not be discovered, and it was believed to stretch four or five hundred square leagues. Arriving at length at a very close field, consisting of bay-ice compacted by drifting fragments, they had recourse to towing, boring, warping, and *mill-dolling*,—a process which consists in the use of a sort of battering-ram. Having thus opened a path across a very broad barrier, they came again to an open sea, which appeared nearly unbounded, having only the ice on the south and the land on the east. As their object was to catch whales, they chose a west-north-west direction. Swiftly crossing the short meridians of this parallel, they soon passed from the 10th degree of east to the 8th degree of west longitude; their latitude being 79° 35′, and the sea still open on every side. As fish, however, did not appear, they changed their tack, and ran east-north-east about 300 miles, till they came to the 19th degree of east longitude, where they found themselves in lat. 81° 30′, being a degree higher than Phipps had attained, and only about 500 geographical miles from the Pole. Had discovery been their object, a favourable opportunity was now offered; and neither master nor mate would

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have been insensible to the glory of acquiring enlarged knowledge of these boundaries of the earth. But they had been fitted out by a mercantile body to bring home a cargo of whale-oil, and this solid purpose could not be postponed for the most brilliant speculations of science. The sea to a great extent lay open before them; but, as it contained no whales, they steered their course backwards towards Hakluyt's Headland, and in its vicinity they caught twenty-four of these valuable animals, from which were extracted 216 tuns of oil.

Mr Scoresby indulged his curiosity by occasionally landing on islands, and clambering up the lofty steeps which usually rise from their shores. The Fair Foreland, at the north-west of Spitzbergen, was the first Arctic ground on which he touched; but the fog soon spread so thickly that he could remark little except the immense multitude of birds which clustered around the rocks and precipices. Afterwards, in 1818, he landed near Mitre Cape, and undertook to reach the summit of the singular cliff of which it consists. Much of the ascent was over fragments of rock, so loose that the foot in walking slid back every step, and the party could make no progress but by the very laborious operations of running and leaping. The continuance of frost appears to cause this extraordinary decomposition of the strata. At one place he found a ridge so steep and narrow that he could seat himself across it as on the back of a horse. He reached the top, estimated at 3000 feet above the level of the ocean, about midnight, when the sun still shone bright upon it, causing such a rapid dissolution of the snow, that streams of water were flowing on all sides. It is considered remarkable that in this frozen region, where even at a moderate elevation the mean annual temperature must be below the freezing-point, the highest summits should put off their winter-covering of snow, in which so many peaks, both of the temperate and of the torrid zones, are perpetually enveloped. It would appear, however, that during the

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short interval of continuous summer-day, the rays of the sun beating perpetually on the mountain-tops, which are raised above the fogs that brood over the sea, produce a degree of heat much greater than corresponds with the latitude. Hence the general average of the year, and especially the months which compose the long Arctic night, must be marked by a fearful depression of the caloric influence.

The view from this mountain is described by Mr Scoresby as equally grand and beautiful. On the east side were two finely sheltered bays; while the sea, unruffled by a single breeze, formed an immense expanse to the west. The icebergs reared their fantastic forms almost on a level with the highest hills, whose cavities they filled, while the sun illumined but could not dissolve them. The valleys were enamelled with beds of snow and ice, one of which extended beyond reach of the eye; and in the interior, mountains rose beyond mountains, till they melted into distance. The cloudless canopy above, and the position of the party themselves, on the pinnacle of a rock surrounded by tremendous precipices, conspired to render their situation equally singular and sublime. If a fragment was detached, either by accident or design, it bounded from rock to rock, raising smoke at every blow, and setting numerous other pieces in motion, till, amid showers of stones, it reached the bottom. The descent of the party was more difficult and perilous than the ascent; the stones sinking beneath their steps, and rolling down, obliged them to walk abreast, otherwise the foremost might have been overwhelmed under the masses which those behind him dislodged. Finally, to the astonishment and alarm of the sailors below, the mate and his companions, at one place, slid down an almost perpendicular wall of ice, and arrived in safety at the ships. The beach was found nearly covered with the nests of terns, ducks, and other tenants of the Arctic air, in some of which there were young, over whom the parents

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kept watch, and, by loud cries and vehement gestures, sought to defend them against the predatory tribes which hovered around.

Mr Scoresby, also, in 1817, made an excursion on Jan Mayen's Land. The most striking feature was the stately Beerenberg, which rears its head 6870 feet above the sea; and being seen at the distance of thirty or forty leagues, proves a conspicuous landmark to the mariner. The first objects that attracted the eye were three magnificent icebergs, which rose to a very great height, stretching from the base of the mountain to the water's edge. Their usual greenish-gray colour, diversified by snow-white patches resembling foam, and with black points of rock jutting out from the surface, gave them exactly the appearance of immense cascades, which in falling had been fixed by the power of frost. A party ascended an eminence which constituted only the lower ridge of the hill, yet was itself 1500 feet high; and they were not long in discovering that the materials which composed it were entirely volcanic. They trode only upon ashes, slag, baked clay, and scoriæ; and whenever these substances rolled under their feet, the ground beneath made a sound like that of empty metallic vessels or vaulted caverns. On the summit they observed a spacious crater, about 600 feet deep and 700 yards in diameter, the bottom of which was filled with alluvial matter, and which, being encompassed by rugged walls of red clay half-baked, had the appearance of a spacious castle. A spring of water penetrated its side by a subterranean canal, and disappeared in the sand. No attempt was made to ascend the principal cone, which towered in awful grandeur, white with snow, above the region of the clouds; but at its feet was seen another crater surrounded by an immense accumulation of castellated lava. A large mass of iron was found, that had been smelted by the interior fires. The volcano was at this time entirely silent; but next year smoke was seen rising from it to a great height; and the same phenomenon had, in 1818, been

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discerned by Captain Gilyott of the Richard, who even remarked a shining redness like the embers of a large fire.

The most important discoveries, however, effected by Mr Scoresby, took place in 1822, when he sailed in the ship Baffin, of 321 tons and 50 men, for the whale-fishery. In search of a better fishing-ground, he was led to the eastern coast of Greenland,—a tract absolutely unknown, unless at a few points which the Dutch had approached; and it formed a continuous line with the shore on which the colonies of Old Greenland, the subject of much controversy, were supposed to have been situated.

In approaching this interesting coast, he was amused by the singularly refractive power of the Polar atmosphere, when acting upon ice and other objects discerned through its medium. The rugged surface assumed the forms of castles, obelisks, and spires, which here and there were sometimes so linked together as to present the appearance of an extensive city. At other times it resembled a forest of naked trees; and Fancy scarcely required an effort to identify its varieties with the productions of human art,—colossal statues, porticos of rich and regular architecture,—even with the shapes of lions, bears, horses, and other animals. Ships were seen inverted, and suspended high in the air, and their hulls often so magnified as to resemble huge edifices. Objects really beneath the horizon were raised into view in a most extraordinary manner. It seems positively ascertained, that points on the Greenland shore, not above 3000 or 4000 feet high, were seen at the distance of 160 miles. The extensive evaporation of the melting ice, with the unequal condensation produced by streams of cold air, are considered as the chief sources of this extraordinary refraction.

It was on the 8th of June that, in 74° 6′ north latitude, the coast was discovered, extending from north to south about ninety miles, and of which the most northerly point was concluded to be that named on the charts

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Gale Hamkes' Land, while the most southerly appeared to be Hudson's Hold-with-Hope. Mr Scoresby's ambition, however, to mount some of its crags, which no European foot had ever trodden, was defeated by an impassable barrier of ice; and a similar one having closed in behind him, he was obliged to sail back and forward several days through a narrow channel. During this interval he had a good opportunity of taking the bearings and directions of the principal objects on land. The latitude, as given in the maps, was tolerably correct, and was indeed his only guide in tracing the positions; for the longitude, after the most careful observation, was found to differ seven degrees from that in the best charts, and ten degrees from what is found in those usually supplied to the whale-fishers. The country was generally mountainous, rugged, and barren, bearing much resemblance to Spitzbergen, though less covered with snow. It could not be fully ascertained whether some low ground might not be interposed between the sea and the mountains; but their aspect, and the general analogy of the Arctic shores, suggested the idea that these mighty cliffs dipped perpendicularly into the waves.

Mr Scoresby followed the usual system of naming the more prominent objects in the territory embraced by his discoveries. The two principal bays or inlets were designated Captain Kater and Sir Walter Scott; while two spacious forelands or projecting peninsulas, the former supposed to be an island, were assigned to Dr Wollaston and Sir Everard Home. Other bays and capes were bestowed upon Sir Thomas Brisbane, Dr Brinkley, Colonel Beaufoy, Dr Holland, Mr Herschel, and some of the author's personal friends. Afterwards, obtaining the view of some smaller bays to the south, he was enabled to pay a similar compliment to Sir George Mackenzie, Sir Charles Giesecke, Baron Humboldt, M. de la Place, and M. Freycinet.

He now made a movement eastward in search of whales, of which he found no traces in the vicinity of

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land,—a change of purpose which was attended with a very distressing circumstance. William Carr, one of his most expert harpooners, and a fine active fellow, had struck a whale, which flew off with such rapidity that the line was jerked out of its place, and threatened the sinking of the boat. Having snatched the rope to replace it in the proper position, he was caught by a sudden turn, instantly dragged overboard, and plunged under water to rise no more. The boat having at once righted itself, the sailors looked round and asked, "Where is Carr!" One man only had seen him disappear, but so instantaneously, that he could not describe the manner of the accident.

On the 19th July the navigators came in view of a range of coast, of a very bold and peculiar character, extending about forty miles. It presented a mountain-chain from three to four thousand feet high, rising at once from the beach in precipitous cliffs, which terminated in numberless peaks, cones, and pyramids. In one instance there appeared to rise six or seven tall parallel chimneys; one of which, crowned with two vertical towers, was called Church Mount. This coast received the name of Liverpool; while to the mountains was given that of Roscoe. The range of shore terminated at Cape Hodgson; beyond which, however, steering south-west, they descried three other promontories; to these were successively given the appellation of Cape Lister, Cape Swainson, and Cape Tobin. Here Mr Scoresby took, for the first time, the opportunity of landing; when he found the beach much lower than that farther to the north, and consisting in a great measure of loose stony hills. After some examination, he came, near Cape Swainson, to an enclosure similar to those which the Esquimaux construct for their summer-huts, and within which were hollow structures like bee-hives, such as they use for stores. There were also some remains of fuel, charred drift-wood, half burnt moss and ashes; which last was considered as indicating the place that must have been occupied at no distant

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period. As a farther confirmation of this opinion, he likewise found instruments of wood and bone, one of them tipped with iron.

Resuming his course at sea, and still holding south-westward, he now discovered a spacious inlet, to which, in looking upwards, no boundary could be seen. While penetrating this opening he observed another sound branching to the northward behind the Liverpool coast, and supposed to form it into an island. The opposite shore of this entrance was named Jameson's Land, from the eminent professor of natural history in Edinburgh. Beyond Cape Hooker, the southern point of the coast just described, another large inlet stretched towards the north, to which was given the name of Captain Basil Hall. It had every appearance of converting Jameson's Land into an island; and the coast to the westward of it received the name of Milne's Land. Between Cape Leslie, constituting the northern point of that coast, and Cape Stevenson, on the opposite shore, the original opening continued to stretch into the interior, without any appearance of a termination. Combining this observation with the position of Jacob's Bight in the same latitude on the western coast, which Sir Charles Giesecke traced to the height of 150 miles, where it opened into a sort of inland sea, there appeared a strong presumption that, instead of the continuous mass of land which our maps represent, Greenland composes only an immense archipelago of islands. To this great inlet, the entrance of which was bounded by Cape Tobin on the north and Cape Brewster on the south, the navigator gave the name of his father, though posterity will probably be apt to associate with himself the name of "Scoresby's Sound."

These coasts, especially that of Jameson's Land, were found richer in plants and verdure than any others seen on this occasion within the Arctic circle, and almost meriting the distinction of Greenland. The grass rose in one place to a foot in height, and there were meadows of several acres which appeared nearly equal to any in

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England. But nowhere could a human being be discovered; though there were every where traces of recent and even frequent inhabitation. At the foot of certain cliffs, named after Dr Neill, secretary to the Wernerian Society, were several hamlets of some extent. The huts appear to have been winter-abodes, not constructed of snow-slabs like the cells of the Esquimaux of Hudson's Bay, but resembling those of the Greenlanders, dug deep in the ground, entered by a long winding passage or funnel, and roofed with a wooden frame overlaid with moss and earth. The mansion had thus the appearance of a slight hillock. Near the hamlets were excavations in the earth, serving as graves, where implements of hunting, found along with the bones of the deceased, proved the prevalence here of the general belief of savage nations, that the employments of man in the future life will exactly resemble those of the present. There was one wooden coffin, which the navigator was willing to believe might mark a remnant of European colonization. Still it was thought singular that the dwellers on this coast should have been recently so numerous, and yet not one of them left; but it occurred that these were probably winter-quarters, and that during the summer the natives might have repaired into the interior in search of those land-animals which retreat to the southward in the more rigorous season.

On emerging from this large sound, and proceeding southward, Mr Scoresby discovered another continuous range of coast, where he observed a bay, which he named after Mr Wallace, and three capes after Messrs Russell, Pillans, and Graham, all eminent professors in the Scottish capital; also an island, which he dedicated to Captain Manby; another island and a cape, which he associated with the reputation of Dr Henry and Mr Dalton, two distinguished chemists at Manchester; and finally a third cape, which he assigned to Dr Barclay of Edinburgh.

Disappointed as to any appearance of whales on this coast, he again steered to the northward, where icebergs

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surrounded him, amounting at one place to the number of five hundred. This course brought him in a few days within sight of lands stretching still higher than those recently surveyed, and connecting them with the others which he had first discovered. There appeared two large territories, seemingly insular, to which were given the names of Canning and Traill; and between them was a most spacious inlet, honoured with the name of Sir Humphry Davy. On penetrating this opening, there arose several points of land, probably islands, presenting a range of mountains, which were made commemorative of Werner, the celebrated geologist; a smaller ridge was assigned to Dr Fleming; after which were appropriated Capes Biot, Buache, and Carnegie. He landed on Traill Island, and with incredible toil clambered to the top of a hill, where he hoped to have found a small plain containing a few specimens of Arctic vegetation; but this summit was steeper than the most narrowly pitched roof of a house, and, had not the opposite side been a little smoother, he would have found much difficulty in sliding down. Beyond this island, and separated from it by a considerable inlet named after Lord Mountnorris, was another coast; the pointed extremity of which received the name of Captain Parry. This promontory being at no great distance from Cape Freycinet, which had been seen in the first survey, there was thus completed the observation of a range of four hundred miles of coast, formerly known only by the most imperfect notices, and which might therefore be strictly considered as a new discovery.

Mr Scoresby afterwards approached more closely to Canning Island, and penetrated a sound between it and the main, connected apparently with Hurry's Inlet, and where he gave names to Capes Allan, Krusenstern, and Buch. He would have been happy to examine more of the Greenland coast, having on one occasion had a fair propect of being able to run southward to Cape Farewell; but the ship was not his own, and his duty to his employers compelled him to turn in another direction.

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He had hitherto met with much disappointment; and, the season being far advanced, he was apprehensive of being obliged to return with a deficient cargo. But on the 15th of August numerous whales appeared round the ship: of these five were struck and three taken, which at once rendered the ship *full-fished*, and placed him among the most successful adventurers of the year. He could therefore return with satisfactory feelings; and the pleasure of the voyage homeward was only alloyed by the occurrence of a violent storm off Lewis, in which Sam Chambers, one of the most esteemed and active of his crew, was washed overboard.

To these discoveries some additions were made next year by Captain Clavering, who was employed by the Admiralty to convey Captain Sabine to different stations in the Arctic Sea, for the purpose of making observations on the comparative length of the pendulum, as affected by the principle of attraction.

Clavering sailed on the 3d May 1823, and on the 2d June arrived at Hammerfest, where he landed the philosopher with his tents and instruments. The observations being completed, he weighed anchor on the 23d, reached the northern coast of Spitzbergen, and fixed on a small island between Vogel Sang and Cloven Cliff for farther operations. While Captain Sabine was employed upon the island, he endeavoured to push into a more northern latitude; but, after great exertion, he could not reach beyond 80° 20′. Accompanied by the former, whom he had now rejoined, and whose observations were finished, he left this coast on the 22d July, and steered for the eastern shores of Greenland, of which he came in view on the 5th August. The scene appeared the most desolate he had ever beheld. The mountains rose to the height of several thousand feet, without a vestige of vegetation, or the appearance of any living creature on the earth or in the air. Even the dreary waste of Spitzbergen appeared a paradise to this. He landed his passenger and the scientific apparatus on two islands detached from the eastern shore of the continent, which he called the

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Pendulum Islands, and of which the outermost point is marked by a bold headland rising to the height of 3000 feet.

While Captain Sabine was employed in his peculiar researches, the other surveyed a part of the coast which lay to the northward, being the first which Mr Scoresby saw. It lay at some distance, with an icy barrier interposed; but was found indented with deep and spacious bays, suspected even to penetrate so far as to convert all this range of coast into a cluster of islands. The inlet, which the former navigator had assigned to Sir Walter Scott, was believed by Clavering to be that discovered by the Dutch mariner Gale Hamkes; but we have not ventured to remove this last from the more northerly position preferred by the scientific whaler. Other openings which occurred in proceeding towards the north were named by the captain, Foster's Bay, Ardincaple and Roseneath Inlets; and he saw bold and high land still stretching in this direction as far as the seventy-sixth degree of latitude.

In regard to the natives this commander was more fortunate than his predecessor, who saw only their deserted habitations. On landing at a point on the southern coast of Sir Walter Scott's Inlet, he received intelligence of Esquimaux having been seen at the distance of a mile, and hastened thither with one of his officers. The natives on seeing them immediately ran to the top of some rocks; but the English advanced, made friendly signs, deposited a mirror and a pair of worsted mittens at the foot of the precipice, and then retired. The savages came down, took these articles, and carried them away to the place of their retreat; but they soon allowed the strangers to approach them, though their hands when shaken were found to tremble violently. By degrees confidence was established, and they conducted the visiters to their tent, five feet high and twelve in circumference, composed of wood and whalebone. Their aspect and conformation, their boats and implements, exactly corresponded to those observed by

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Captains Parry and Lyon in Hudson's Bay. A child, after being diligently cleared of its thick coating of dirt and oil, was found to have a tawny, copper-coloured skin. The natives were astonished and alarmed beyond measure by the effect of fire-arms. A seal being shot, one of them was sent to fetch it. He examined it all over till he found the hole made by the ball, when, thrusting his finger into it, he set up a shout of astonishment, dancing and capering in the most extravagant manner. Another was prevailed upon to fire a pistol; but instantly, on hearing the report, started and ran back into the tent.

The observations were not completed till the beginning of September, when the season was too late to allow Captain Clavering to gratify his wish of making a run to the northward. Nor did he extricate himself from the ice without some severe shocks; but, nevertheless, after spending six weeks at Drontheim, he entered the Thames about the middle of December.

We shall here, though deviating somewhat from a Polar direction, notice some recent attempts to complete the exploration of the eastern coast of Greenland. The Danish government, which holds the sovereignty over this vast extent of dreary shores, seems to have felt it unsuitable, while others were making important discoveries, that Denmark herself should remain inactive. In 1828, accordingly, they employed Captain Graah to proceed from the western settlements along the eastern side, as high as Cape Barclay, in latitude 69° 13′, with the particular view of tracing any indications of the early colonies believed to have been established there, but said to have been cut off from the civilized world by an accumulation of ice. This officer, accordingly, in the spring of 1829, set out with a party in an open boat from Nennortalik, where he had wintered, and succeeded in surveying the coast as far as the latitude of 65° 18′, when he was arrested by the frost. He observed, however, in 65° 30′ some islands, which he conceives were those of Danel. Having spent the winter of 1829-30 on the east coast, in latitude

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63° 22′, in the spring of the latter year he again sailed northward, but was unable even to reach the point gained in the preceding summer. He considered that by his observations he had completely disproved the possibility of any civilized settlements, with towns or churches, having ever existed on this part of Greenland. Only a few scattered inhabitants, amounting in all to between 500 and 600, were met with in the course of his expedition. Their language and customs were similar to those of the Esquimaux; yet it is very remarkable that in size, shape, complexion, and in the form and expression of their countenance, they differ materially from that race, and bear much greater affinity to the Norwegians. Among the women and children, particularly, he observed many individuals having brown hair, while black is the universal colour among the other Greenlanders. In their intercourse they were found to be friendly, honest, and hospitable.*

There still remained between the most northerly point reached by Captain Graah and Cape Barclay, the most southerly one observed by Scoresby, an unexplored coast of three degrees and a half, or about 240 miles in direct distance. The French government, ambitious to complete the survey of this Arctic territory, fitted out the Lilloise brig of war, and gave the command to M. de Blosseville, already known as an eminent navigator. He sailed from Dunkirk in the spring of 1833, and arrived in July on the eastern shores of Iceland. Proceeding thence he explored ten leagues of the seacoast of Greenland (between 68° 34′, and 68° 55′), which had never been described by any former discoverer. From some unexplained cause he returned to Iceland, though he wrote on the 5th of August from Vapnafiord, and again on the 16th, when on the eastern coast, that he was setting out to complete his undertaking, which he expected to effect in twenty days. The ice was already dense and impenetrable; but by steer-

* Journal of Geographical Society, vol. i. p. 247, &c.

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ing along its outer edge, as if it were land, he hoped without danger to accomplish his object. These, however, were the last accounts received from this distinguished seaman, whose fate is still involved in a painful mystery.

Next season the same government despatched M. Dutaillis, in La Bordelaise, to learn, if possible, what had become of his predecessor. He arrived at Vapnafiord on the 22d May 1834, but appears to have been misled by vague reports, which induced him to believe that De Blosseville had sailed, not towards the north, but to the western coast of Iceland. It was not therefore till the 5th August that he actually steered in the former direction, which was by much the more probable one; but the advanced season, with the tremendous sea, so alarmed him, that he determined to return. The authorities at Paris, however, considering, not without reason, that this search was very unsatisfactory, despatched, in April 1835, another vessel, named the Recherche, commanded by M. Trehouart. The king also, in conformity with a report made by Admiral Duperrey, offered a liberal reward to any one who should either aid in saving De Blosseville, or even bring satisfactory intelligence respecting the armament placed under his charge. The Recherche on the 7th May reached the coast of Iceland; but in July, off Greenland, the crew encountered such obstruction from ice, that they were forced to relinquish any farther search. M. Trehouart accordingly returned to the former place, whence, sailing on the 1st September, he arrived at Cherbourg on the 13th of the same month.*

We have departed somewhat from the regular order of time, for the purpose of giving in a connected view the discoveries of Mr Scoresby and others along the coast of Greenland. Meantime, however, another at-

* United Service Journal, May 1835. Nautical Magazine, No. xli. p. 437; and xliv. p. 625.

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tempt had been made to explore the depth of the Polar Sea. Combined with Captain Ross's expedition in search of the North-west Passage, the Dorothea and Trent were placed under the command of Captain Buchan, with the view of pushing direct to the Pole, and endeavouring, not only to reach that grand boundary, but to pass across it to India,—a voyage which, from the relative position of these two parts of the globe, would have been much shorter by this route than by any other. It was contended by the supporters of this undertaking, that the failures of Hudson, Fotherby, and Phipps, had occurred in consequence of their being entangled in the bays of Spitzbergen; that the production of ice takes place chiefly in the neighbourhood of land; and that, by keeping in the midst of the ocean, navigators would find an open sea.

Captain Buchan, having set out early in the season of 1818, came on the 27th May in view of Cherie Island. Without pausing there, he stretched along the western coast of Spitzbergen to the eightieth degree of north latitude, where he encountered a severe storm, which separated his vessels for a time, and obliged them to seek shelter in Magdalena Bay. On the 10th June he met several Greenland ships, and was informed by the masters that, in the great sea to the westward, to which he had looked with the most sanguine hope, the ice was completely impenetrable. He determined, therefore, to turn Hakluyt's Headland, and proceed north-eastward in the track ultimately followed by Lord Mulgrave. On his way he was soon completely beset, being hemmed in by fields of ice ten or twelve miles in circumference, amid which icebergs rose in the rudest and most fantastic forms, appearing like specks in a boundless plain of alabaster. On the 26th June the navigators reached Fair Haven, situated between Vogel Sang and Cloven Cliff. Being detained here for some time, they found numerous herds of the walrus and the deer, and killed, after hard combats, several of the former,—one weighing a ton; while of the latter they despatched with

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ease from forty-five to fifty, the average weight of which was 120 lbs. Being at length enabled to move forward, they reached the latitude of 80° 32′, where they were beset three weeks. On the 29th July, the Dorothea was again brought into open water; but on the 30th she was exposed to a tremendous gale, which blew her upon the main body of the ice with a force that she was unable to resist. In this awful situation, the crew having no time to deliberate, determined to turn the helm so that the wind might drive the ship's head into the ice, where it was possible they might find a secure lodgement even amid this fearful tempest. The rudder was accordingly placed in the manner directed, and a solemn awe impressed the mariners during the few moments which were to decide whether the Dorothea was to be safely moored, or to be dashed to pieces. She struck with a terrible shock, which was repeated frequently in the course of half an hour. By that time she had forced her way more than twice her own length into the body of the ice, where she remained immovably fixed. By and by the gale moderated, and she was again brought into an open sea; but she had been so shattered, and the water entered by such numerous leaks, that scarcely any effort could preserve her from sinking. Next morning, however, being fine, the crew with much difficulty worked her round to the harbour of Smeerenberg. There she was so far refitted as to be able in the beginning of September to take the sea, and on the 10th October came in view of the coast of England, near Flamborough Head.

No farther attempt was made to reach the Pole in *ships;* but, after a certain interval, a plan was devised to accomplish that object in vehicles drawn over the frozen surface of the ocean,—a scheme first suggested by Mr Scoresby. In a memoir read by this gentleman to the Wernerian Society, he endeavoured to prove that such a journey was neither so visionary nor so very perilous as it might appear to those who were unacquainted with the Arctic regions. The Polar Sea, he

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doubted not, would in some meridians present one continued sheet of ice, the inequalities of which would oppose no insurmountable barrier. Intervals of open water would be more troublesome; yet the vehicle, being made capable of serving as a boat, might either sail across or make a circuit round them. This conveyance, he remarked, ought to be a sledge formed of those light materials used by the Esquimaux in the construction of their boats, and drawn either by rein-deer or dogs. The former animals are so fleet, that, in favourable circumstances, they might go and return in a fortnight, while the best dog-team would require five or six weeks; the latter, however, would be more tractable, and better fitted for skimming over thin or broken ice. Though the cold would be very severe, yet, as no alarming increase occurred between the seventieth and eightieth degrees of latitude, there was little ground to apprehend that in the remaining ten degrees it should become insupportable. For provisions were recommended portable soups, potted meats, and other substances, which, with little weight, contained much nourishment.

These suggestions did not for a considerable time attract attention; but at length Captain Parry, after his three brilliant voyages to the north-west, finding reason to suspect that his farther progress in that direction was hopeless, turned his thoughts to the probability of penetrating over the frozen sea to the Pole. Combining Mr Scoresby's ideas with his own observations, and with a series of reflections derived by Captain Franklin from his extensive experience, he submitted to the Lords of the Admiralty the plan of an expedition over the Polar ice. Their lordships, having referred this proposal to the council and committee of the Royal Society, and received a favourable report as to the advantages which science might derive from such a journey, applied themselves with their usual alacrity to supply the captain with every thing which could assist him in this bold undertaking. The

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Hecla was employed to carry him to the northern coast of Spitzbergen, where she was to be secured in a safe harbour or cove; and with her were sent two boats, to be dragged or navigated, according to circumstances, from that island to the Pole. These boats being framed of ash and hickory, covered with waterproof canvass, over which were successive planks of fir and oak, with a sheet of stout felt interposed, united the greatest possible degree of strength and elasticity. The interior was made capacious and flat floored, somewhat as in troop-boats, and a runner attached to each side of the keel fitted them to be drawn along the ice like a sledge. Wheels were also taken on board, in case their use should be found practicable.

The adventurers started on the 27th March 1827, and were towed down the river by the Comet steam-boat. On the 4th April they weighed anchor from the Nore, and on the 19th entered the fine harbour of Hammerfest in Norway, where they remained two or three weeks, and took on board eight rein-deer, with a quantity of picked moss for their provender. Departing on the 11th May, they soon found themselves among the ice, and met a number of whale-ships. On the 13th they were in view of Hakluyt's Headland, when the captain endeavoured to push his way to the north-east in the track of Phipps. The vessel, however, was soon completely beset, and even enclosed in a large floe, which carried her slowly along with it. As every day was now an irretrievable loss, Captain Parry became impatient in the extreme, and formed a plan to push off northward, leaving the ship to find a harbour for herself, where he trusted on his return to trace her out. But the survey of the route in the proposed direction was most discouraging. In consequence of some violent agitation the preceding season, the ice had been piled up in innumerable hummocks, causing the sea to resemble a stone-mason's yard, except that it contained masses ten times larger. This state of the surface, which would have rendered it impossible to drag the boats more than

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a mile in the day, was found to prevail for a considerable space with little interruption. The current meantime continued to carry the ship, with the floe to which she was fastened, slowly to the eastward, till it brought her into shoal water. Captain Parry lowered a boat, and found some heavy masses of ice attached to the bottom in six fathoms; after which he felt it quite out of the question to leave her with a diminished crew, and exposed to so much danger, arising from the combined difficulty of unsurveyed ground and ice. The conclusion was therefore irresistibly forced upon his mind, that a secure harbour must be sought for the vessel before setting out with the boats. No choice was then left but to steer back for the coast of Spitzbergen, where he unexpectedly lighted on a very convenient recess, named by him Hecla Cove; and it proved to be part of the bay to which an old Dutch chart gives the name of Treurenberg. It was now the 20th of June, and the best of the season had been spent in beating backwards and forwards on these ice-bound shores; he therefore resolved, without farther delay, to prosecute the main object of his enterprise, and though scarcely hoping to reach the Pole, he determined at all events to push as far north as possible. He took with him seventy-one days' provision, consisting of pemmican (beef dried and pounded), biscuit, cocoa, and rum. The spirit of wine, as the most portable and concentrated fuel, was alone used for that purpose. There were provided changes of warm clothing, thick furdresses for sleeping in, and strong Esquimaux boots. The rein-deer and also the wheels were given up at once as altogether useless in the present rugged state of the ice; but four sledges, constructed out of the native snow-shoes, proved very convenient for dragging along the baggage.

On the 22d June the expeditionary party quitted the ship, and betook themselves to the boats amid the cheers of their associates. Although all the shores were still

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frozen, they had an open sea, calm and smooth as a mirror, through which, with their loaded vessels, they advanced slowly but agreeably. After proceeding thus for about eighty miles, they reached, not, as they had hoped, the main body of the ice, but a surface intermediate between ice and water. This could neither be walked nor sailed over, but was to be passed by the two methods alternately; and it was on such a strange and perilous plain that it behoved them to land, in order to commence their laborious journey towards the Pole.

Captain Parry describes in an interesting manner the singular mode of travelling which they were compelled to adopt. The first step was to convert night into day; to begin their journey in the evening and end it in the morning. Thus, while they had quite enough of light, they avoided the snow-glare and the blindness which it usually produces; besides, the ice was drier and harder beneath them; and they enjoyed the greatest warmth, when it was most wanted, during the period of sleep, though they were a little annoyed by dense and frequent fogs. Thus their notions of night and day became inverted. They rose in what they called the morning, but which was really late in the evening, and, having performed their devotions, breakfasted on warm cocoa and biscuit; then drawing on their boots, usually either wet or hard frozen, which, though perfectly dried, would have been equally soaked in fifteen minutes, the party travelled five or six hours, and a little after midnight stopped to dine. They next accomplished an equal journey in what was called the afternoon; and in the evening, that is, at an advanced hour in the morning, halted as for the night. After applying themselves to obtain rest and comfort, they put on dry stockings and fur boots, cooked something warm for supper, smoked their pipes, told over their exploits, and forgetting the toils of the day, enjoyed an interval of ease and gayety. Then well wrapped in their fur cloaks, they lay down in the boat, rather too close together perhaps, but with

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very tolerable comfort; and, in due time, the sound of a bugle roused them to their breakfast of cocoa, and to a repetition of the same arduous duties.

The progress for several days was most slow and laborious. The floes were small, exceedingly rough, and intersected by lanes of water, which could not be crossed without unloading the boats. It was commonly necessary to convey these and the stores by two stages, and the sailors, being obliged to return for the second portion, had to go three times over the same ground; sometimes they were obliged to make three stages, and thus to pass over it five times. There fell as much rain as they had experienced during the whole course of seven years in a lower latitude. A great deal of the ice over which they travelled was formed into numberless irregular needle-like crystals, standing upwards, and pointed at both ends. The horizontal surface of this part had sometimes the appearance of greenish velvet, while the vertical sections, when in a compact state, resembled the most beautiful satin-spar, and asbestos when going to pieces. These peculiar wedges, it was supposed, were produced by the drops of rain piercing through the superficial ice. The needles at first afforded tolerably firm footing; but, becoming always more loose and moveable as the summer advanced, they at last cut the boots and feet as if they had been penknives. Occasionally, too, there arose hummocks so elevated and rugged that the boats could only be borne over them, in a direction almost perpendicular, by those vigorous operations called "a standing pull and a bowline haul." The result of all this was, that a severe exertion of five or six hours did not usually produce a progress of above a mile and a half or two miles, and that in a winding direction; so that, after having entered upon the ice on the 24th June, in latitude 81 degrees 13 minutes, they found themselves on the 29th only in 81 degrees 23 minutes, having thus made only about eight miles of direct *northing*. Captain Parry soon relinquished all hope of reaching the Pole; however, it was resolved to

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push on as far as possible, and the party coming at length to somewhat smoother ice and larger floes, made rather better progress. While the boats were landing on one of these, the commander and Lieutenant Ross usually pushed on to the other end to ascertain the best course. On reaching the extremity, they commonly mounted the largest hummock, whence they beheld a sight of which nothing could exceed the dreariness. The eye rested solely upon ice, and a sky hid in dense and dismal fogs. Amid this scene of inanimate desolation, the view of a passing bird, or of ice in any peculiar shape, excited an intense interest, which they smiled to recollect; but they were principally cheered by viewing the two boats in the distance, the moving figures of the men winding with their sledges among the hummocks, and by hearing the sound of human voices, which broke the silence of this frozen wilderness. The rain, and the increasing warmth of the season, indeed, gradually softened the ice and snow, but this only caused the travellers to sink deeper at every step. At one place they sunk repeatedly three feet, and required three hours to make a hundred yards. As they halted on the evening of the 5th July, the margin of the floe broke, and a bag of cocoa fell into the sea, but luckily alighted on a tongue of ice and was taken up.* At the same time pools and even lakes were formed on the frozen surface; and though the peculiar blue of these superglacial lakes formed one of the most beautiful tints in nature, this was a poor compensation for being obliged to make a great circuit in order to avoid them. Still, amid all these difficulties, the floes became on the whole larger, the lanes of water longer, and the day's journey was gradually extended. Having attained 82

* It may be mentioned, that the contents of the package here alluded to were found to be quite uninjured after this rude immersion,—a protection ascribed to "Mackintosh's waterproof canvass,"—a manufacture which, as a security for sea-stores, is mentioned by Captain Parry in terms of the highest commendation.

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degrees 40 minutes, they began to hold it as a fixed point, that their efforts would be crowned with success so far as to reach the eighty-third parallel. This hope seemed converted into certainty, when, on the 22d, they had travelled seventeen miles, the greater proportion of which was directly north. But there now occurred an unfavourable change, which baffled all their exertions. Down to the 19th the wind had blown steadily from the south, which, though without aiding them much, had at least checked the usual movement of the ice in that direction. On the last of these days, however, a breeze sprung up from the north, which opened, indeed, a few lanes of water; but this, it was feared, could not compensate for the degree in which it must cause the loosened masses of ice, with the travellers upon them, to drift to the southward. This effect was soon found to take place to an extent still more alarming than had been at first anticipated; for, instead of ten or twelve miles, which they reckoned themselves to have achieved northward on the 22d, they were found not to have made quite four. This most discouraging fact was at first concealed from the sailors, who only remarked, that they were very long of getting to the 83d degree. The expedition was now fast approaching the utmost limits of animal life. During their long journey of the 22d they only saw two seals, a fish, and a bird. On the 24th only one solitary *rotge* was heard; and it might be presumed that, from thence to the Pole, all would be a uniform scene of silence and solitude. The adventurers pushed on without hesitation beyond the realms of life; but now, after three days of bad travelling, when their reckoning gave them ten or eleven miles of progress, observation showed them to be four miles south of the position which they occupied on the evening of the 22d; the drifting of the snow-fields having in that time carried them fourteen miles backward. This was too much; and to reach even the eighty-third degree, though only twenty miles distant, was now beyond all reasonable hope. To ask the men to undergo

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such unparalleled toil and hardship, with the danger of their means being exhausted, while an invisible power undid what their most strenuous labours accomplished, was contrary to the views of their considerate commander. In short, he determined that they should take a day of rest, and then set out on their return. This resolution was communicated to the crew, who, though deeply disappointed at having achieved so little, acquiesced in the necessity, and consoled themselves with the idea of having gone farther north than any previous expedition of which there was a well authenticated record.

The return was equally laborious as the going out, and in some respects more unpleasant from the increasing softness of the ice and snow,—depriving them of confidence in any spot on which they placed their boats or persons, and often sinking two or three feet in an instant. However, the drift southward made no longer any deduction from their progress, but added to it, every observation giving them several miles beyond their reckoning. There was more open water, and it was a relief to them that the sun in their nightly journeying was lower in the horizon; while, being to the northward, he did not, as formerly, glare in their faces. They met several bears, and killed one, which was eagerly devoured by the hungry crew; but the meal was followed by such symptoms of indigestion as inspired an unfavourable opinion regarding the flesh of this animal, though Captain Parry attributed the bad effects to the enormous quantity eaten. At length, on the 11th August, they heard the sound of the surge breaking against the exterior margin of the great icy field. They were soon launched on the open sea, and reached Table Island, where a supply of bread had been deposited; but Bruin had discovered it, and devoured the whole. They found, however, some accommodations; while the stores left at Walden Island were still quite undisturbed. On the 21st the navigators arrived in Hecla Cove, from whence, soon afterwards, they sailed for England.

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Such was the result of the first and only attempt to penetrate to the Pole over the frozen surface of the deep. All the energy and hardihood of British seamen were exerted to the utmost, without making even an approach towards the fulfilment of their intention. A failure so complete has suspended for the present every idea of resuming the project; yet there seems nothing in the details just given to deter from the enterprise as impossible, or even to render it very unfeasible. The unfavourable issue seems evidently owing to the advanced season of the year, when the thaw and consequent dissolution of the ice had made great progress, and all the materials of the great northern floor were broken up. The water, in its progressive conversion from solid into fluid, presented only a treacherous quicksand, in which the travellers sunk at every step, not without the risk of being finally swallowed up. The ice, in these intermediate stages of its transition from hard to soft, and in the breaches and pressures to which this gave rise, assumed much more rugged forms than when it was spread and fast bound over the surface of the ocean. Its tendency also, when loosened, to float to the southward, inevitably defeats every attempt to proceed over it in a contrary direction; for which reason we concur in Mr Scoresby's opinion, that a departure much earlier in the season would be quite indispensable to give any chance of success. We would even go farther than that navigator, and advise the adventurers to start at the dawn of the Polar day, when there would be a probable chance of returning by the end of June. The great plain of ice would be much smoother and firmer at that than at any other season. It would be deeply covered with snow, which would fill various interstices, convert rugged steeps into sloping ridges, and produce a surface generally more level and uniform. This coating, too, would then be much harder, perhaps sufficient to sustain the weight both of the men and boats, and afford every where sure and solid footing, and wheels, it is probable, might be employed with advantage, though wholly unfit for that rugged and sinking

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surface over which Captain Parry was obliged to tread. We are even inclined to ask, whether other machinery might not be beneficially introduced? Could there not be constructed a light portable bridge, to be thrown across chasms and from hummock to hummock, over which the keel of the boats by due adaptation might slide as on a railway, and the evils of friction be avoided?— The cold, doubtless, would be most intense; but Captain Parry's experience and management during his four winterings seem to have removed every apprehension that it would prove fatal. The boats might be hermetically closed, with winding entrances, like the winter-huts of the Esquimaux; and it was clearly established that, even in the darkest depths of the Polar winter, provided tempest did not fill the sky, it was possible, and even most salutary, to perform brisk movements in the open air. The travellers would indeed require an addition to their spirituous fuel, not a weighty article; also a larger stock of clothes; but these last it would be every way expedient to wear on their persons. The only circumstance which seems seriously alarming, is an observation made by Captain Parry, that the daily allowance of provision, amounting to ten ounces of biscuit and nine of pemmican, was not found sufficient to maintain the men in full vigour; and truly, when contrasted with their severe toils, it does appear an inadequate supply. It were dreadful indeed to think of sending a party to the Pole on short allowance. The quantity could not well be increased without making the drag too severe; but we cannot help thinking that the victuals selected fulfilled very imperfectly the obvious condition of being such as to comprise the greatest possible nutriment in the least possible bulk. Thus it seems unaccountable that the greater part of the food should have been farinaceous, in the form of dry biscuit, which contains surely much less nourishment than the same weight of animal food. We pretend not to be at all versant in the mysteries of cookery; yet portable soup, for instance, might certainly have been so prepared as to embody a much

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greater amount of nutritive substance than mere dried and pounded beef; and, if duly seasoned, might have formed a most comfortable mess under the snows of the Pole. The addition of some rich cakes, cheese, and butter, might seem likely to compose a store which, without exceeding in weight that of Captain Parry, would yield a much larger proportion of nourishment and strength.—We should hesitate to recommend Mr Scoresby's plan of being drawn to the Pole by rein-deer, or even of trusting to a team of any description. These animals would be liable to many casualties, and, should they break down at an advanced period of the route, the result might be disastrous in the extreme.

This project would require, of course, that the ship should winter on the northern coast of Spitzbergen,—an arrangement, we conceive, indispensable to avoid that delay which had such an influence in frustrating the late expedition. We are surprised to find that even Captain Parry, after so many successful winterings, considers this as a serious objection. In fact, on seeing it admitted, that before the close of autumn a ship might penetrate to 82°, and perhaps to 83°, we are tempted to ask whether a discovery-vessel might not, in the first season, push forward to that latitude, and select a station either in an island, if such should be found, or if not, whether it might not enclose itself within one of the great fields of ice, and there await the arrival of spring? A very considerable and probably the roughest portion of the Polar route would thus be avoided.

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CHAPTER X.

The Northern Whale-Fishery.

Objects of the Whale-fishery—Early practised on the Coasts of Europe—First Fishing-voyages to the Arctic Sea—Disputes between the different Nations—Accommodation effected—Dutch Fishery—English Fishery; Its slow Progress and ultimate Success—Various Attempts to form Fishing Settlements on the Arctic Shores—Mode of conducting the Fishery—Equipment—Voyage—Attack and Capture of the Whale—Operation of Flensing, &c.—Situations in which the Fishery is carried on; Its Dangers—Various Shipwrecks and Accidents—Recent Changes in the Fishing-stations; Increased Dangers—Capital invested in the Trade; Its Produce; Ports whence it is carried on—Disasters and Shipwrecks of 1830; Adventures on the Ice; Extrication of the remaining Vessels; General Results—Abstract of the Whale-fishings from 1815 to 1834 inclusive—Statement from 1835 to 1842—Details for 1843 and 1844.

We have frequently had occasion to notice the great number and stupendous magnitude of those animal forms with which nature has filled the abysses of the Arctic Ocean. The cetaceous orders, which, in some respects, belong exclusively to those northern depths, would for ever have remained undisturbed in the vast domain which Providence has assigned to them, had not the spirit of avarice commenced a deadly warfare. Man, ever searching for objects which may contribute to his accommodation, discovered, in those huge animals, a variety of substances fitted for the supply of his wants. Even after his more refined taste rejected their flesh as food, the oil was re-

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quired to trim the winter lamp, and to be employed in various branches of manufacture; while the bone, from its firm, flexible, and elastic quality, is peculiarly fitted for various articles of dress and ornament.

It has been generally supposed that whale-fishing, as a commercial pursuit, arose subsequently to the revival of navigation in Europe; but the researches of Mr Scoresby leave no doubt that, on a small scale at least, it existed at a much earlier period. Even the voyage of Ohthere, in 890, shows that its operations were already carried on with some activity on the coast of Norway: indeed, it was natural that, in this native region of the *cetacea*, their capture should commence sooner than elsewhere, and at an era probably ascending far beyond human records. Still this was not the true whale,—an animal which never leaves its haunts within the Arctic zone. It was that species of dolphin called bottle-nose, which alone reaches the northern extremities of Europe; is occasionally stranded on the coasts of Orkney and Shetland; and at times penetrates much farther south.

The Northmen, in their career of conquest and settlement, introduced on the coast of France the hunting of the whale, which, to these hardy mariners, was at once a trade and a sport,—having found in the southern seas an inferior species, attracted thither by the shoals of herrings on which it feeds. These smaller fish frequent the Bay of Biscay, to which they seem to make a periodical migration, and where they are arrested by the wide circuit of its shores. Ancient documents prove that the Normans, the Flemings, and even the English, regarded them as a valuable commodity; less, however, for the oil, which in this species is not very abundant, than for the flesh, which satisfied the hunger and even pleased the palate of our rude ancestors. Whales' tongues are ranked among the delicacies that adorned the table during the middle ages.

The bay just named was the principal scene of this fishery, which was almost entirely engrossed by the people inhabiting its interior shores; those of Bearn and

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Gascony on the French side, and of Biscay on the Spanish. The Basques in particular soon surpassed all other nations, and carried to such perfection the processes connected with this pursuit, that the most expert whale-fishers in modern times have done little more than copy their usages. By degrees they extended their adventures into the northern seas, where they met the people of Iceland, a Norwegian colony, who had already engaged in this trade; and here, combining their efforts with those of the natives, they soon brought it into a very flourishing state.

It was still, however, conducted on a small scale, when compared with the enterprise of modern times. Yet the first northern navigators were not attracted thither by this special object, but stumbled on it, as it were, in the course of their attempts to accomplish a passage to India by the Arctic seas. Barentz, in 1596, discovered Spitzbergen, long the main seat of the fishery, and even examined a considerable extent of its shores; but as the obstruction presented by this island defeated his hopes of reaching India, and as his voyage closed at last in disaster, no other result was obtained beyond a certain knowledge of geography and of the animal kingdom.

The English were the first who pushed their operations into the depth of the Arctic Ocean. The Bear Island of the discoverer just mentioned, being rediscovered and named after Alderman Cherie, gave rise to a series of voyages for the capture of the walrus, of which some account has been already given. The views of the merchants were much extended, when Hudson, having engaged in his daring attempt to reach the Pole, surveyed Spitzbergen or East Greenland to its northern extremity; and although unable to penetrate farther, he gave information regarding the immense number of whales which were seen on those shores. Thenceforth the adventurers fitted out for discovery were instructed to cover their expenses, as far as might be, by the occasional capture of these valuable animals. This arrangement, as formerly remarked, was not happy, so far as the interests of

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geographical science were concerned, since the considerations of profit too often superseded the main object of the voyage. Poole, in 1610, confined his views almost entirely to the capture of the walrus; but, as he saw a great abundance of whales, the Company next year sent out the Mary Margaret, furnished with Biscayan harpooners, and with every thing requisite for the great fishery. Captain Edge accordingly succeeded in taking a small whale, which yielded twelve tuns of oil; the first, as he conceives, that was ever extracted in those seas. Though the termination of this voyage was unfortunate, the Muscovy Company next season sent out two ships, the Whale and the Seahorse, to follow up the design. The Dutch, meantime, intent on every form of commercial adventure, had vessels that very year for the same purpose in the Greenland waters. These our countrymen chose to consider as interlopers, and, being the stronger party, compelled them to decamp without even attempting the fishery; and the following summer the Company obtained a royal charter, prohibiting all besides themselves to intermeddle in any shape with this valuable branch of industry. To make good this privilege, which the Dutch were not disposed to consider well founded, they fitted out seven well-armed ships, whose commanders, on reaching Spitzbergen, saw themselves anticipated by vessels belonging to different nations. All these they compelled either to depart, or to fish under the condition of delivering half of the proceeds to the English as the lords of the northern seas. So busy were they, however, in excluding others, that they themselves returned very slenderly laden. Foreigners exclaimed against this interference as a most flagrant instance of tyranny perpetrated by the new mistress of the ocean; and, indeed, the grounds on which England rested her claim do not, in any point of view, appear valid. She alleged, indeed, the prior occupation by Sir Hugh Willoughby; but supposing that the mere glimpse, through mist and tempest, of the Spitzbergen coast could have

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established a permanent right to rule over the neighbouring waters, this discovery was shown by Peter Plancius the cosmographer to have been made by Barentz, and not by Sir Hugh. The commencement of the fishery by our countrymen formed certainly a better claim; though by no means sufficient to establish a perpetual sovereignty over those vast seas. The Hollanders, therefore, determined not only to refuse acquiescence, but to repel force by force; for which purpose they sent out fleets so numerous and so well armed, that for some years only slight annoyances were sustained by them; while the two governments appear to have looked on and allowed the adventurers to fight it out. At length, in 1618, a general encounter took place, which terminated to the disadvantage of the English, one of whose ships was taken and carried into Amsterdam. The Dutch administration, reluctant to involve themselves in a quarrel with their powerful neighbour, prudently restored the vessel with its lading and crew,—bestowing at the same time a reward on the gallant seamen who had made the capture. It now appeared expedient to put an end to this unseemly collision. There was admitted to be room enough for all the nations of Europe, provided they ceased to interfere with each other; and therefore a division was made of the coasts and bays of Spitzbergen among such states as had been accustomed to resort to the fishery. The English, allowed in some sense to have the best claim, were favoured with the first choice; they pitched upon Horizon Bay, Clock Bay, Safety Port, and Magdalena Bay, in the more southern part of the coast, and near the large island called Charles' Foreland. Then followed the other nations in the order of their adjudged rights. The Dutch selected the fine island at the north-west extremity, which they named Amsterdam, with three bays, one of which, between it and the mainland, they called Hollanders' Bay. The Danes and Hamburghers found an island and a bay between the Dutch and English stations: while the

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French and Spaniards were obliged to content themselves with Biscayners' Point and other bleak promontories along the northern coast.

The Muscovy Company by this arrangement were allowed full scope for carrying on the trade, from which they diligently excluded the rest of their countrymen. Their pursuits, however, were probably too various, and their transactions on too great a scale, for permitting them to bestow on this difficult branch that close attention which could alone render it productive. The gains of their fishery being more than absorbed by extensive losses, they gradually limited their transactions, till England scarcely sent a ship to the north, and saw all the markets filled by her industrious rivals.

The Dutch, meantime, succeeded in converting it into a grand source of national wealth. At first, according to the usage of the time, they constituted an exclusive company, though on a somewhat liberal scale. The original body, formed at Amsterdam, was obliged to admit others belonging to Zealand and Friesland, and finally to receive into their number many wealthy individuals of the province of Holland. The nation, having thus invested an immense capital in this trade, carried it on with their characteristic prudence, and soon raised it to the highest pitch of prosperity. On their first arrival in the northern seas, the whales were seen extended on the face of the deep without any fear, and presenting themselves, as it were, to the stroke of the harpoon. The only difficulty was to carry them home; for one or two such large animals were sufficient to fill a ship. They therefore adopted the plan of extracting on the spot the oil and bones; thus reducing all the valuable substance into so small a compass, that one ship could convey the produce of an extensive fishery. They founded the village of Smeerenberg, in the bay of the same name, where fish were discovered in extraordinary abundance. Boilers, tanks, coolers, and all the requisite apparatus, were erected on an immense scale; and this station, during the summer, became

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crowded and populous, realizing in some degree the idea of a northern Batavia. In this dreary corner, too, were enjoyed all the luxuries of life, among which are specially mentioned hot rolls, prepared every morning; and upon a bell being rung, all the inhabitants ran to supply themselves with a dainty that seemed to belong to a different climate. Zorgdrager mentions that he entered this bay in 1697, and found it occupied by 188 vessels, having on board the produce of 1959 fish.

Under these circumstances, the trade, even in the hands of an exclusive company, became an abundant source of wealth. Soon, however, it experienced an unforeseen reverse. The whales, pursued and killed in such vast numbers, learned to dread the assault of that mighty destroyer who had invaded their haunts, undisturbed for so many ages. They gradually, and at last almost entirely, deserted Smeerenberg, removing into North Bay, where they were still taken with facility; but much loss of time was incurred in the conveyance of the carcasses to the former station. From this retreat, also, they gradually receded, and the fishers were obliged to follow them into the open sea, where both the capture and transportation became more and more difficult. These valuable animals relinquished part after part of their native deeps, and were every where compelled to give way before a power which they could not otherwise escape; seeking their final refuge near that great bank of ice which forms the western boundary of the Whale-fishers' Bight in the Greenland Sea. Thither it behoved the pursuers to repair; where, mooring themselves to frozen fields, they watched with no small hazard the movements of their prey. The expense and delay of conveying their prizes, sometimes 2000 miles, to the harbour of Smeerenberg, becoming very inconvenient, arrangements were made, by which the whale, being fastened to the sides of the ship, was *flensed*, or cleared of its blubber and bone; after which the carcass was consigned to the deep. The port then lost every foundation on which its prosperity had rested. The

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stores, furnaces, capacious vessels, and numerous utensils, were carried away; hence it is now difficult to trace the spot on which stood that once-flourishing settlement. At the same time the trade, becoming at once expensive and perilous, was no longer considered advantageous to an exclusive body. The company was accordingly dissolved, and the fishery thrown open to all who chose to engage in it: and such is the activity of individual enterprise, that, even under a diminished prospect of success, a greater number of ships than ever were fitted out from the ports of Holland.

The English meantime did not remain altogether unconcerned spectators of this commercial industry on the part of their neighbours. After the Muscovy Company was off the field, another was instituted under the title of "The Company of Merchants of London trading to Greenland." They subscribed a capital of £40,000, which was increased successively to £82,000, though only £45,000 was actually paid. This undertaking proved so disastrous that in nine years the entire funds were lost and the concern broken up. Its fall is traced by Elking to the wasteful management incident to large associations carrying on their business by uninterested agents. Their officers and men were paid by a fixed salary instead of receiving a share of the produce; and therefore it is not surprising that they should have spent long intervals on shore, amusing themselves with hunting deer, and appropriating to their own use the fruits of the chase. The wreck of their last ship, after the capture of eleven whales, precipitated their ruin.

The legislature, mortified that this trade, which was enriching the neighbouring nations, should prove so fruitless in the hands of Britons, redoubled their encouragements, and exempted from all duty the produce of the national whale-fisheries. Thus favoured, and stimulated by the representations of Mr Elking, the South Sea Company determined to embark in this pursuit a large proportion of their capital; and accordingly in 1725 they built twelve large vessels, fully sup-

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plied with all fishing-implements. These ships went out in spring, and returned with twenty-five fish, which did not quite pay the expense of equipment; however this, upon the whole, was thought not a bad beginning, and gave hopes of improvement, which were far from being fulfilled. In 1730 twenty-two were sent out, and returned with only twelve whales; so that a loss was incurred of nearly £9000. The following season was little better; and the Company, finding that in eight years they had expended an immense sum without the least prospect of repayment or profit, threw up the trade altogether.

Notwithstanding these repeated and signal failures, the British government did not relax their zeal. In 1732 a bounty of twenty shillings per ton was granted to every ship exceeding 200 tons employed in the whale-fishery. Several private individuals were thus induced to embark in the trade, and with tolerable success; yet there being still no appearance of its rising to any national importance, the bounty was extended, in 1749, to forty shillings. This produced at length the desired effect. In 1752 no fewer than forty sail went out, including several from Scotland, whose merchants, in 1750, had begun to participate in the adventure. In five years they increased to eighty-two; and down to 1775 the trade continued in a varying but generally prosperous state. Some regulations had been introduced, with the view of making it more efficient as a nursery of seamen; and in 1769 it was considered firmly established, after the nation had paid in bounties upwards of £600,000, then reckoned an enormous sum. These considerations induced the legislature, in 1777, to reduce the rate to thirty shillings; but the fishery could not support itself on this encouragement, and between the years 1775 and 1781 the vessels employed fell from 105 to 39. The allowance of forty shillings being restored, it regained its full prosperity, which soon appeared so steady as to admit the reduction of the bounty; the total amount of which, paid down to

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1786, had not fallen short of £1,266,000. It was therefore reduced, in 1787, to thirty shillings; in 1792, to twenty-five shillings; and in 1795, to twenty shillings. Even under this lowest grant the fishery increased; able and intelligent whale-captains were formed; and Britain soon outstripped all other nations in a pursuit in which her first steps had been so tardy. Another circumstance doubtless much favoured this progress. The Dutch, having imprudently admitted the French into their territory, were soon absorbed in the destructive vortex of that revolutionary power. Involved in her long war with the mistress of the seas, and subjected to the anti-commercial policy of Napoleon, Holland saw all her fisheries, with every other branch of her foreign commerce, completely annihilated, and British vessels enjoying the undisturbed possession of the northern seas. Peace, indeed, at length re-opened to that nation all these channels of industry; but during a suspension of twenty years their habits were altered, their connexions dissolved, their most skilful and intrepid whale-fishers had died out; while England, which had been in a state of constant activity and improvement, was now every way an overmatch for her formerly successful rival.

Before proceeding to describe the operations of the whale-fishery, it may be proper to mention some attempts which, with a view to its more effectual prosecution, were made to establish colonies on the shores of the Polar Sea.

In 1633 the Dutch planned a settlement on the northern coast of Spitzbergen, seven sailors having volunteered for this arduous undertaking. On the 30th August the fleet left them in North Bay, where they not only undertook to live during the winter, but even to provide themselves with fresh provisions. They visited all the surrounding shores, took three rein-deer and a number of sea-swallows, collecting also a great quantity of a species of water-cress. Their great ambition was to catch a whale; but, though tantalized by

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the sight of many, all their attempts failed. Even one found dead and fresh on the margin of the sea was floated out by the tide before they could secure it.

It was on the 3d October that the extreme cold began to be felt, accompanied by the flight of numerous birds passing to the southward. On the 13th one of the casks of beer was frozen three inches thick. The winterers were obliged to break the ice in pieces, and thaw it before the fire; but it made a very unpalatable liquor. On the 15th, having ascended one of the neighbouring mountains, they could see only a small portion of the sun's disk on the verge of the horizon, and in a few days it entirely disappeared; there was still a faint twilight of eight hours, which was soon reduced to five, and became every day shorter and shorter. In November the cold increased to the utmost pitch; they could not sleep in their beds, but were obliged either to crouch over the fire or run at full speed through the hut, to keep up the vital energy. At length they ranged all their couches round the fire-place and a stove, yet still found it necessary to lay themselves down between the stove and the fire, holding their feet to the very embers. On the 20th December they saw a very bright illumination, resembling the Aurora Borealis, over the southern part of the sky. They could not, however, believe it to be the real Aurora, which they afterwards saw of peculiar splendour in its proper place. Night and winter continued in their utmost intensity till the 22d January, when they again enjoyed a twilight of six hours; at mid-day of the 26th there was no longer a star to be seen; but it was the 22d February ere, from a mountain-top, they could descry any portion of the sun's disk. Throughout the whole period they had dreadful contests to maintain with the Polar bear. On the 3d March one of these animals had received two balls in the throat, which he was endeavouring to pluck out with his paws, when the whole seven sailors rushed on him with their lances. The bear dashed at one of them, tore the lance from his hand, and threw him on the ground; but, as

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the animal was about to destroy his victim, another sailor struck and obliged him to quit his hold. Afterwards, however, though pursued by all the seven, he plunged into the sea and escaped.

It is remarkable that these persons passed this hard winter without any severe attack of scurvy; and on the 27th May they were overjoyed by the view of a boat, which conveyed them to a neighbouring bay, where several Dutch ships had assembled for the fishery. The active life led by these seamen must have been the chief cause by which their health was so well preserved.

The success of this experiment induced the same Company to repeat the attempt in the following year, when seven other sailors, well furnished with victuals, and apparently with every means of withstanding the rigour of the climate, undertook to winter in Spitzbergen. They appear, however, to have been of a less active disposition than their predecessors, and failed in every attempt to procure fresh victuals. The sun having quitted them on the 20th October, they shut themselves up in their hut, out of which they scarcely ever stirred. In a few weeks they were attacked by scurvy in its most malignant form, which, in the absence of fresh meat and vegetables, assumed continually a more alarming type, till three died, whose bodies the others with difficulty enclosed in coffins. The survivors killed a dog and a fox, which afforded some relief, but not enough to arrest the progress of the malady. The bears began to approach the hut, and would have been a blessing, had the men retained strength either to shoot the animals or to drag home the carcass. Their mouths became ulcerated; they were unable to chew their biscuit; and only Jerome Carloen had power to rise from bed and kindle a fire. The sun appeared on the 24th February; but they could no longer derive aid from this benignant luminary. The last entry in their journal is in the following terms:—"We are all four stretched on our beds, and are still alive, and would eat willingly, if any one of us were able to rise and light a fire. We implore the Almighty,

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with folded hands, to deliver us from this life, which it is impossible to prolong without food or anything to warm our frozen limbs. None of us can help the other; each must support his own misery."—Early in spring the fishing-vessels arrived, and a party hastened to the hut. It was so fast closed that an entrance could only be effected by opening the roof. They found it a tomb. Three of the men were enclosed in the coffins which had been framed for them; the other four lay dead,—two in their beds, and two on a piece of sail spread on the floor. These last had perished in consequence of mere inability to make the effort necessary for lifting and dressing the food; and they had suffered convulsions so dreadful, that their knees and chin had come into contact, and their bodies resembled a rounded block.

The Dutch about the same time made an attempt to establish a colony on the island of Jan Mayen, but with a result equally fatal. The journal of the unfortunate seamen contains little except a very exact register of the weather.

No farther attempts were made at that time to colonize Spitzbergen; and the next instance of wintering on those dreary shores arose from necessity. A Russian vessel, which had sailed from Archangel for the whale-fishery in 1743, being driven by the wind to the eastern side of the island, found itself beset amid floating ice without hope of deliverance. One of the party recollected that a hut had been erected on this coast by some of his countrymen, under the apprehension of being obliged to spend the winter there. He and three others set out to discover the place. With much difficulty they reached the land, leaping from fragment to fragment of moving ice; then, spreading themselves in different directions, they found the cottage, which, though ruinous, afforded shelter for the night. Early in the morning they hastened to the shore, to convey to their comrades this happy intelligence. But what must have been their horror, when they saw only a vast open sea, without a vestige of the ship, or even of the numerous

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icebergs which had been tossing through the waves. A violent gale had dispersed them all, and apparently also destroyed the vessel, which was never heard of more.

These four unfortunate seamen, abandoned in such frightful circumstances, having the long winter to pass without food, or implements to procure any, did not, however, give way to despair. They had a gun, with which they shot twelve deer; then their ammunition failed; but some pieces of iron were found on the shore, which they contrived to fashion into pikes. At the moment when their stock of venison was nearly exhausted, they found occasion to employ these weapons against a Polar bear by which they were assailed. The animal, being vanquished and killed after a formidable struggle, supplied for the present all their wants. His flesh was food, his skin clothing, his entrails, duly prepared, furnished the string, which alone had been wanting to complete a bow. With that instrument, they were more than a match for the rein-deer and the Arctic fox, with the spoils of which they filled both their pantry and their wardrobe; and thenceforth they avoided, unless in cases of necessity, the encounter of the bear. Being destitute of cooking-utensils, they were obliged to devour the food nearly raw—dried either by suspension in the smoke during the long winter, or by exposure to the heat of the sun during the short summer. Yet this regular supply of fresh meat, and, above all, the constant exercise to which necessity prompted, enabled them to preserve their health entire during six years, in which they looked in vain for deliverance. In this time they killed 10 bears, 250 rein-deer, and a multitude of foxes. At the end of the period one of them died, when the three survivors sunk into despondence, giving up all hopes of relief, and looking forward to the moment when the last of them would become the prey of the bears. Suddenly, on the 15th August 1749, having descried a vessel at sea, they lighted fires on the heights, hoisted a flag formed of rein-deer skins, and were at length discovered by the ship, which proved to belong

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to their native country. They loaded her with such a quantity of skins and lard as enabled them to pay eighty rubles for their passage, and afterwards to make a profitable voyage.

The example, thus involuntarily set by these Russian sailors, has been followed to a considerable extent by their countrymen, some of whom have since regularly wintered in huts on the Spitzbergen coast, employing themselves in chasing the walrus and seal along the shore, and the deer and Arctic fox in the interior. They are constantly engaged in hunting, unless when interrupted by tempest; and, even when the hut is blocked up with snow, they find their way out by the chimney. They have a reserve of salt provisions; but as much as possible subsist on the flesh and drink the warm blood of the rein-deer, digging under the snow for cochlearia, sorrel, and other plants that act as antidotes to scurvy. By this regimen they generally preserve their health completely uninjured; though the British employed in whale-fishing have occasionally found the body of a Russian who had fallen a victim to this dreadful malady.

It is now time to give some account of the mode of catching whales, as practised by the two great fishing-nations of the present day,—the British and the Dutch.

The first object is to fit out a ship suited to the trade. While the fishery was carried on in bays, or on the exterior margin of icy fields, very slight fabrics were sufficient; but now that the vessels depart early in the season, and push into the very heart of the northern ices, they are liable every moment to the most severe shocks and concussions. The ship, therefore, must be constructed in such a manner as to possess a peculiar degree of strength. Its exposed parts are secured with double or even treble timbers; while it is *fortified*, as the expression is, externally with iron plates, and internally with stanchions and cross-bars, so disposed as to cause the pressure on any one part to bear upon and be supported by the whole structure. Mr Scoresby recommends the dimension of 350 tons as the most eligible.

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A ship of this size is sometimes filled; and the number of men required for its navigation, being also necessary for manning the boats employed in the fishery, could not be reduced even in a much smaller vessel. A larger tonnage than 350, being scarcely ever filled, involves the proprietor in useless expense. The Dutch are of opinion, that the vessels destined for this service should be 112 feet long, 29 broad, and 12 deep, carrying seven boats, and from forty to fifty seamen. One of the most essential particulars is the crow's nest, a species of sentry-box made of canvass or light wood, pitched on the maintop-mast, or top-gallant-mast head. This is the post of honour, and also of severe cold, where the master, provided with a telescope and a speaking-trumpet, often sits for hours in a temperature thirty or forty degrees below the freezing-point, and whence he can descry all the movements of the surrounding seas, and give directions accordingly.

The whaling-vessels usually take their departure in such time as to leave the Shetland Isles about the beginning of April, and before the end of the month arrive within the Polar Seas. It was long customary to spend a few weeks at what is called the Seal-fisher's Bight, extending along the coast of Greenland, ere they pushed into those more northern waters where, amid fields of ice, the whale is commonly found; but in later times it has become usual to sail at once into that centre of danger and enterprise.

As soon as they have arrived in those seas, the crew must be every moment on the alert, keeping watch day and night. The seven boats are suspended by the sides of the ship, ready to be launched in a few minutes; and, when the state of the weather admits, one of them is usually manned and afloat. These boats are from 25 to 28 feet long, about 5½ feet broad, and constructed with a special view to lightness, buoyancy, and easy steerage. As soon as the person in the crow's nest hears the blowing of the huge animal which they seek to attack, or sees its back emerging from the waves, he gives

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notice to the watch who are stationed on deck, part of whom leap into a boat, which is instantly lowered down, and followed by others. Each of the boats has a harpooner and one or two subordinate officers, and is provided with an immense quantity of rope coiled up and stowed in different quarters of it, the several parts being spliced together so as to form a continued line, usually exceeding four thousand feet in length. To the end is attached the *harpoon* (fig. 1), an instrument formed, not to pierce and kill the animal, but, by entering and remaining fixed in the body, to prevent its escape. One of the boats is now rowed towards the whale in the deepest silence, cautiously avoiding to give an alarm, of which he is very susceptible. Sometimes a circuitous route is adopted in order to attack him from behind. Having approached as near as is consistent with safety, the harpooner darts his instrument into the back of the monster.* This is a critical moment; for, often when the mighty animal feels the wound, he throws himself into violent convulsive movements, vibrating in the air his tremendous tail, one lash of which is sufficient to dash a boat in pieces. More commonly, however, he plunges rapidly into the sea, or beneath the thickest fields of ice. While he is thus moving, at the rate usually of eight or ten miles an hour, the utmost diligence must be used, that the line to which the harpoon is attached may run off smoothly and readily along with him. Should it be entangled for a moment, the strength of the whale is such that he would draw down the boat and crew after him. The first boat ought to be quickly followed up by a second, to supply more line when the first is run out, which often takes place in eight or ten minutes. When this inconvenience is dreaded, the men hold up one, two, or three oars, to intimate their pressing need of a supply.

* The harpoon is sometimes discharged from a peculiar species of gun, in which case the form fig. 4 is employed; but this mode has not come into very general use.

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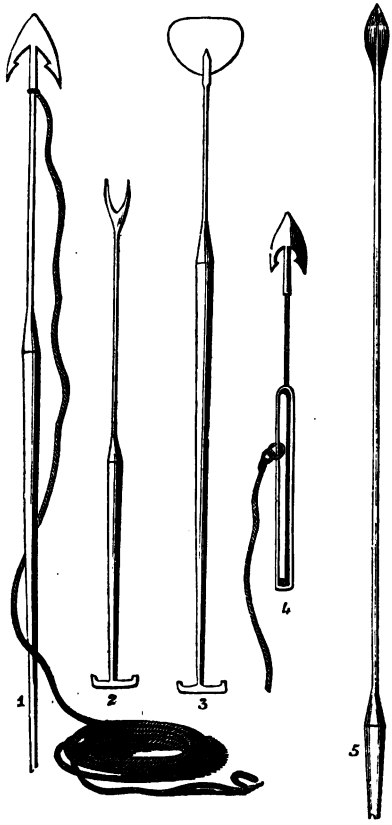

1. Hand Harpoon. 2. Pricker. 3. Blubber Spade.
4. Gun Harpoon. 5. Lance.

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At the same time they turn the rope once or twice round a kind of post called the bollard or billet-head, by which the motion of the line and the career of the animal are somewhat retarded. This, however, is a delicate operation, which brings the side of the boat down to the very edge of the water, and if the rope is drawn at all too tight, may sink it altogether. While the line is whirling round the bolard, the friction is so violent that the harpooner is enveloped in smoke, and water must be constantly poured on to prevent it from catching fire. When, after all, no aid arrives, and the crew find that the line must run out, they have only one resource,—they cut it, losing thereby not only the whale, but the harpoon and all the ropes of the boat.

When the whale is first struck and plunges into the waves, the boat's crew elevate a flag as a signal to the watch on deck, who give the alarm to those asleep below, by stamping violently on the deck, and crying aloud—"*A fall! A fall!*" (Dutch, *val*, expressing the precipitate haste with which the sailors throw themselves into the boats.) On this notice they do not allow themselves time to dress, but rush out in their sleeping-shirts or drawers into an atmosphere the temperature of which is often below zero, carrying along with them their clothing in a bundle, and trusting to make their toilet in the interval of manning and pushing off the boats.

The period during which a wounded whale remains under water is various, but is averaged by Mr Scoresby at about half an hour. Then, pressed by the necessity of respiration, he appears above, often considerably distant from the spot where he was harpooned, and in a state of great exhaustion, which the same ingenious writer ascribes to the severe pressure that he has endured when placed beneath a column of water 700 or 800 fathoms deep. All the boats have meantime been spreading themselves in various directions, that one at least may be within a *start*, as it is called, or about 200 yards of the point of his rising, at which distance they

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can easily reach and pierce him with one or two more harpoons before he again descends. On his re-appearance a general attack is made with lances (fig. 5), which are struck as deep as possible, to reach and penetrate the vital parts. Blood mixed with oil streams copiously from his wounds and from the blow-holes, dyeing the sea to a great distance, and sometimes drenching the boats and crews. The animal now becomes more and more exhausted; but, at the approach of death, he often makes a convulsive struggle, rearing his tail high in the air, and whirling it with a noise which is heard at the distance of several miles. At length, quite overpowered, he lays himself on his side or back, and expires. The flag is then taken down, and three loud huzzas raised from the surrounding boats. No time is lost in piercing the tail with two holes, and through these ropes are passed, by which the fish is towed to the vessel.

The whale being secured to the sides of the ship, the next operation is that of *flensing*, or removing the blubber and whalebone,—a process which, if the full strength of the crew be put upon it, may be executed in about four hours, though a much longer time is often employed. The captain goes round and gives a dram to each seaman, with double allowance to important personages called the kings of the blubber (Dutch *speck-kóning*), whose office it is to receive that precious commodity, and stow it in the hold. Another high functionary, called the *specksioneer*, has the direction of all the cutting operations. The first step is to form round the fish, between the neck and the fins, a circle called the *kent*, around which all proceedings are to be conducted. To it is fastened a machinery of blocks, called the kent-purchase, by which, with the aid of a windlass, the body of the whale can be turned on all sides. The harpooners then, under the specksioneer's direction, begin with a kind of spade (fig. 3), and with huge knives, to make long parallel cuts from end to end, which are divided by cross-cuts into pieces of about half a ton. These are conveyed on deck, and, being reduced into

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smaller portions, are received by the two kings, who stow them in the hold. Finally, being by other processes still farther divided, the blubber is put into casks, and the packing completed by the instrument No. 2. As soon as the cutting officers have cleared the whole surface lying above water, which does not exceed a fourth or a fifth of the animal, the kent-machinery is applied, and turns the carcass round till another part yet untouched is presented. This being also cleared, the mass is again turned, and so on till the whole has been exposed, and the blubber removed. The kent itself is then stripped, and the bones of the head being conveyed on board, there remains only the *kreng*, a huge heap of muscular substance, which is abandoned, either to sink, or be devoured by the flocks of ravenous birds and sharks which duly attend on this gratifying occasion.

The success of the fishery varies with the spot in which whales are found; the most advantageous being the border of those immense fields of ice, with which a great extent of the Arctic Ocean is covered. In the open sea, when a whale is struck, and plunges beneath the waters, he may rise in any part of a wide circuit, and at any distance from the boats; so that, before a second harpoon can be struck, he may plunge again, and by continued struggles effect his extrication. But, in descending beneath the ice he is hemmed in by the floor above, and can only find an atmosphere to breathe by returning to its outer boundary. The space in which he can rise is thus contracted from a large circle to a semicircle, or even smaller segment. Hence a whale in this position is attacked with much better chance of success; even two may be pursued at the same moment, —a measure which, in the open sea, often occasions the loss of both. In the flourishing state of the Dutch fishery, a hundred of their vessels have been seen at once ranged on the margin of one of those vast fields, along which the boats formed so continuous a line that no whale could rise without being immediately struck.

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This situation, at the same time, is attended with considerable danger from the disruptions and concussions to which these plains are liable.

When the ship is surrounded with floating fragments of ice, the fishery, though difficult, is usually productive. But the case is very different when these pieces are packed together into a mass impervious to the boats, yet leaving numerous holes or openings, through which the whale can mount and respire, without coming to the open margin or within reach of his assailants. The fishers, when they see the whale blowing through one of these apertures, must alight on the ice, and run full speed to the spot with lance and harpoon. Attack in such circumstances, however, is extremely perilous; and even when the whale is killed, the dragging of his body either under or over the ice to the ship is a most laborious task, which, in the last case, cannot be effected without cutting the carcass in pieces.

In the progress of the season, when the frozen surface becomes open at various points, the fishery is liable to the same evils as occur among packed ice. Still worse is the case when the sea is overspread with that thin, newly formed crust called bay-ice; for the whale easily finds or beats a hole through this covering, while the boats can neither penetrate nor the men walk over it, without the most imminent danger. Yet Mr Scoresby mentions a plan by which he continued to carry on his movements, over a very slender surface of this kind. He tied together his whole crew, and made them thus walk in a long line one behind another. There never fell in above four or five at a time, who were easily helped out by the rest. The sufferers had a dram to console them after their cold plunge; and the compensation was considered so ample, that Jack was suspected of sometimes allowing himself to drop in with the view of being thus indemnified.

Another grand distinction respects, first, the Greenland fishery, which, generally speaking, is that already described, and is chiefly distinguished by the immense

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fields of ice which cover the ocean; and, secondly, the Davis' Strait fishery, where that element appears chiefly in the form of moving mountains, tossing through the deep. This last is dangerous, but usually productive. It commenced at a comparatively late period, since it is not mentioned by the Dutch writers prior to 1719; and Mr Scoresby has been unable to ascertain the date when it was begun by the British. At a comparatively recent period, however, it experienced a remarkable extension, of which a full account will be given in the course of this chapter.

The hazards of the whale-fishery, in spite of the utmost care, and under the direction even of the most experienced mariners, are many and great.

The most obvious peril is that of the ship being beset and sometimes dashed to pieces by the collision of the icy mountains with which those seas are continually filled. The Dutch writers mention numerous shipwrecks, among which the following are the most remarkable:—

Didier Albert Raven, in 1639, when on the border of the Spitzbergen ice, was assailed by a furious tempest. Though the ship was violently agitated, he succeeded in steering her clear of the great bank, and thought himself in comparative safety, when all at once there appeared before him two immense bergs, upon which the wind was violently driving his vessel. He endeavoured, by spreading all his sails, to penetrate between them; but in this attempt the ship was borne against one with so terrible a shock that it was soon felt to be sinking. By cutting the masts she was enabled to proceed; yet, as she continued to take in water, several boats were launched, which, being overcrowded, sunk, and all hands perished. Those left on board found their condition more and more desperate. The fore-part of the vessel being deep in the water, and the keel rising almost perpendicular, made it extremely difficult to avoid falling into the sea; while a mast, to which a number had clung, broke, fell down, and involved them in the fate of their unfortunate companions. At

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length the stern separated from the rest of the vessel, carrying with it several more of the sailors. The survivors still adhered to the wretched fragments, but one after another was washed off by the fury of the waves, while some, half-dead with cold and unable to retain their grasp of the ropes and anchors, dropped in. The crew of eighty-six was thus reduced to twenty-nine, when the ship suddenly changed its position, and assumed one in which they could more easily keep their footing on board. The sea then calmed, and during the respite thus afforded they felt an irresistible propensity to sleep; but to some it was the fatal sleep of extreme cold, from which they never awoke. One man suggested the construction of a raft, which was accordingly framed, contrary to the captain's advice; happily, no sooner was it launched than the waves swallowed it up. The remnant of the vessel encountered next night another severe gale; and the sufferings of the crew, from cold, hunger, and burning thirst, were so extreme that death in every form seemed now to have encompassed them. In the morning, however, a sail was descried, their signals were understood, and being taken on board, twenty survivors, after forty-eight hours of this extreme distress, were restored to safety.

In 1670 the Bleacher, Captain Pit, was driven against the ice with such violence that in an instant all her rigging was dashed in pieces. Soon after twenty-nine of the crew quitted the vessel, and, leaping by the help of poles and perches from one fragment of ice to another, contrived to reach the main field. The captain with seven men remained on board, and endeavoured to open a passage; but the ship soon struck again, when they were obliged to go into a boat, and commit themselves to chance, the snow falling so thickly that they could scarcely see one another. As the weather cleared they discovered their companions on the ice, who threw a whale-line, and dragged them to the same spot. There the party, having waited twelve hours in hopes of relief,

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at length trusted themselves to the boats, and in twelve hours were taken up by a Dutchman.

Captain Bille, in 1675, lost a ship richly laden, which went down suddenly; and the crew were not saved until after having been exposed in boats fourteen days. Thirteen other vessels perished that year in the Spitzbergen seas. Three seasons afterwards Captain Bille lost a second ship by the violent concussion of the ice, the crew having just time to save themselves on a frozen field. At the moment of their disaster they were moored to a large floe along with another, a brig called the Red Fox; which last shortly afterwards underwent a similar fate, being struck with such violence that the whole, hull and masts together, disappeared almost in an instant,—the sailors having had merely time to leap on the ice. The united crews now adopted various plans,—some remaining where they were, others setting out in boats in different directions; but all, in one way or other, reached home. The same year the Concord went down in an equally sudden manner; but the crew were happily rescued by a neighbouring ship.

But the whale-fishery is not more remarkable for examples of sudden peril than for unexpected deliverance from the most alarming situations. For instance, three Dutch ships, in 1676, after having completed a rich cargo on the northern coast of Spitzbergen, were at once so completely beset, that the crews in general urged the necessity of proceeding over the ice, and endeavouring to reach some other vessel. Ouvekees, however, captain of one of the three, pressed the obligation of doing all in their power to preserve such valuable property, and they agreed to make a farther trial; when, in twenty days, the ice opened, and they had a happy voyage homeward.

The Dame Maria Elizabeth, in 1769, had set out early for the fishery, and was so fortunate, by the 30th of May, as to have taken fourteen whales. Then, however, a violent gale from the south blew in the ice with such

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violence, that the captain found himself completely beset, and saw two Dutch vessels and one English go to pieces at a little distance. At length a stirring breeze from the north gave him the hope of being extricated; when presently he was involved in a dense fog, which froze so thickly upon the sails and rigging that the ship appeared a mere floating iceberg. On the atmosphere clearing, the faint light, and the migration of birds to the southward, announced the approach of winter. Unable to make any progress, the seamen contemplated with despair the necessity of spending the season in that frozen latitude. They had nearly come to the end of their provisions, and famine was already staring them in the face, when they thought of broiling the whales' tails, which proved very eatable, and even salutary against the scurvy. Thus they hoped to exist till the middle of February, beyond which the prospect was very dismal; but on the 12th November there arose a violent north wind, that dispersed the ice. Their hopes being now awakened, every effort was strained; and on the 18th a north-wester brought on so heavy a rain that next day they were entirely clear of the ice, and had a prosperous voyage homeward.

The year 1777 was one which exhibited on a large scale all the vicissitudes of this occupation. Captain Broerties, in the Guillamine, arrived that year on the 22d June at the great bank of ice, where he found fifty vessels moored and busied in the fishery. He began it successfully: indeed, the very next day he killed a large whale. On the morrow a tempest drove in the ice with such violence that twenty-seven of the ships were beset, and ten were lost. On the 25th July, seeing some appearance of an opening, he caused the Guillamine to be warped through by the boats; but after four days' labour he found himself, with four other ships, in a narrow basin enclosed by icy barriers on every side. Apprehending the danger of being permanently beset, he obliged the men to submit to a diminution of their rations.

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On the 1st August the ice began to gather thickly, and a violent storm driving it against the vessels, placed them in the greatest peril for a number of days. On the 20th a dreadful gale arose from the north-east, in which the Guillamine suffered very considerable damage; and in this awful tempest, out of the five ships two went down, while a third sprung a number of leaks. The crews were taken on board of the remaining two, which they greatly incommoded. On the 25th all the three were completely frozen in, when it was resolved to send a party of twelve men to seek aid from four vessels which a few days previously had been driven into a station at a little distance; but before they arrived two of these had been dashed to pieces, and the other two were in the most deplorable condition. Two Hamburghers, somewhat farther removed, had perished in a similar manner. Meantime the Guillamine and her consorts came in sight of Gale Hamkes' Land in Greenland, and, the tempest still pushing them gradually to the southward, Iceland at length appeared on their left. The two others just mentioned, commanded by Dirk Broer and Roel of Meyer, found a little opening, through which they contrived to escape. The crews of the three first were beginning to hope that they might at last be equally fortunate, when, on the 13th September, a whole mountain of ice fell upon the Guillamine. The men, half naked, leaped out upon the frozen surface, saving with difficulty a small portion of their provisions, and the broken remnants of the vessel were soon buried under enormous piles of ice. The second, commanded by Jeldert Janz, had just met a similar fate, and there remained only that of Jans Castricum, to which all now looked for refuge. By leaping from one fragment to another, the men, not without danger, contrived to reach this vessel, which, though in extreme distress, received them on board. Shattered and overcrowded, she was obliged immediately after to accommodate fifty other seamen, the crew of the Jans Christiaanz of Hamburgh, which had also gone

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down, the chief harpooner and twelve of the mariners having perished. These numerous companies, squeezed into the crazy bark of Castricum, suffered every kind of distress, and were besides menaced with the dread of famine. All remoter fears, however, gave way, when, on the 11th October, the vessel went to pieces in the same sudden manner as the others, leaving the unfortunate sailors scarcely time to remove to the ice with their remaining stores. With great difficulty they reached a field of some extent, and with their torn sails contrived to rear a sort of covering; but sensible that by remaining on this desolate spot they must certainly perish, they saw no safety except by attempting to reach the coast of Greenland, which was in view. With infinite toil they effected their object, and happily met some inhabitants, who entertained them hospitably, and regaled them with dried fish and seal's flesh. Thence they pushed across that dreary region, treated sometimes well, sometimes churlishly; but by one means or other they succeeded at length, on the 13th March, in reaching the Danish settlement of Fredericks-haab. Here they were received with the utmost kindness; and, being recruited from their fatigues, took the first opportunity of embarking for Denmark, whence they afterwards sailed to their native country.

The Davis' Strait fishery has also been marked with very frequent and fatal shipwrecks. In 1814, the Royalist, Captain Edmonds, was lost with all her crew; and in 1817 the London, Captain Mathews, shared the same fate. The only account ever received of either of these ships was from Captain Bennet of the Venerable, who, on the 15th April, saw the London, in a tremendous storm, lying to windward of an extensive chain of icebergs, by some of which it is probable she was dashed to pieces that very evening.

Among accidents on a smaller scale, one of the most frequent is that of boats employed in pursuit of the whale being overtaken by fogs or storms of snow, which prevent them from regaining the vessel. A fatal instance of this

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kind occurred to the Ipswich, Captain Gordon; four of whose boats' crews, after a fish had been caught, and even brought to the ship's side, were employed on a piece of ice hauling in the line, when a sudden storm drifted her so rapidly away, that notwithstanding the utmost efforts, she never came within reach of the unfortunate men who composed the greater part of her establishment. Mr Scoresby mentions several casualties of the same nature which occurred to his boats' companies; all of whom, however, in the end, happily found their way back. One of the most alarming cases was that of fourteen individuals who were left on a small piece of floating ice, with a boat wholly unable to withstand the surrounding tempest; but amid their utmost despair they fell in with the Lively of Whitby, and were most cordially received on board.

The source, however, of the greatest danger to the whale-fisher arises from the physical strength of the animal with which he ventures to contend. Generally, indeed, the whale, notwithstanding his immense power, is extremely gentle,—seeking, even when he is most hotly pursued, to escape from his assailants by plunging into the lowest depths of the ocean. Sometimes, however, he exerts his utmost force in violent and convulsive struggles; and every thing with which, when thus enraged, he comes into collision, is dissipated or destroyed in an instant. The Dutch writers mention Jacquez Vienkes of the Gort Moolen (Barley Mill), who, after a whale had been struck, was hastening with a second boat to the support of the first. The animal, however, rose, and with its head struck the boat so furiously as to shiver it in pieces, and Vienkes was thrown with its fragments on the back of the huge creature. Even then, this bold mariner darted a second harpoon into the body of his victim; but unfortunately he got entangled in the line and could not extricate himself, while the other party were unable to approach near enough to save him. At last, however, the harpoon was disengaged, and he swam to his men.

Mr Scoresby, in one of his earliest voyages, saw a boat

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thrown several yards into the air, which falling on its side, plunged the crew into the sea; but they were happily taken up, when only one was found to have received a severe contusion. Captain Lyons, commanding the Raith of Leith, on the Labrador coast, in 1802, had a boat thrown fifteen feet into the air: it came down into the water with its keel upwards, yet all the men except one were saved.

In 1807, a party under Mr Scoresby the elder had struck a whale, which soon reappeared, but in a state of such violent agitation that no one durst approach it. The captain courageously undertook to encounter it in a boat by himself, and succeeded in striking a second harpoon; but another boat having advanced too close, the animal brandished its tail with so much fury that the harpooner, who was directly under, judged it most prudent to leap into the sea. The tail then struck the very place he had left, and cut the boat entirely asunder, with the exception of two planks, which were saved by having a coil of ropes laid over them; so that, had he remained, he must have been dashed to pieces. Happily all the others escaped injury. The issues, however, were not always so fortunate; for the Aimwell of Whitby, in 1810, lost three men out of seven, and in 1812 the Henrietta of the same port lost four out of six, by the boats being upset and the crews thrown into the sea.

In 1809, one of the men belonging to the Resolution struck a sucking-whale; after which the mother, being seen wheeling rapidly round the spot, was eagerly watched. Mr Scoresby, being on this occasion in the capacity of harpooner in another boat, was selecting a situation for the probable reappearance of the parent fish, when suddenly an invisible blow stove in fifteen feet of the bottom of his barge, which filled with water and instantly sunk. The crew were saved.

Entanglement in the line, while the retreating whale is drawing it off with rapidity, is often productive of great disaster. A sailor belonging to the John of Greenock, in 1818, happening to step into the centre of a coil of run-

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ning rope, had a foot entirely carried off, and was obliged to have the lower part of the leg amputated. A harpooner, belonging to the Henrietta, had incautiously cast some part of the line under his feet; when a sudden dart of the fish made it twist round his body. He had just time to cry out,—"Clear away the line! O dear!" when he was cut almost asunder, dragged overboard, and never more seen.

A whale sometimes causes danger by proving to be alive after having exhibited every symptom of death. Mr Scoresby mentions an instance of one which appeared so decidedly dead that he himself had leaped on the tail, and was busy putting a rope through it, when he suddenly felt the animal sinking from beneath him. He made a spring towards a boat at some yards' distance, and, grasping the gunwale, was assisted on board. The fish then moved forward, reared his tail aloft, and shook it with such prodigious violence that it resounded to the distance of several miles; but after two or three minutes of this violent exertion, he rolled on his side and expired.

Even after life is extinct all danger is not over. In the operation of flensing, the harpooners sometimes fall into the whale's mouth, at the imminent hazard of being drowned. In the case of a heavy swell they are drenched, and sometimes washed over by the surge. Occasionally they have their ropes broken, and are wounded by each other's knives. Mr Scoresby mentions an instance of a man who, after the flensing was completed, happened to have his foot attached by a hook to the kreng or carcass, when the latter was inadvertently cut away. He caught hold of the gunwale of the boat; but the whole immense mass was now suspended by his body, occasioning the most excruciating torture, and even exposing him to the risk of being torn asunder, when his companions contrived to hook the kreng with a grapnel, and bring it back to the surface.

The whale, in attempting to escape, sometimes exerts prodigious strength, and inflicts upon its pursuers not

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only danger, but the loss of their property. In the year 1812, a boat's crew belonging to the Resolution struck one on the margin of a floe. Supported by a second boat, they felt much at their ease, there being scarcely an instance in which the assistance of a third was required in such circumstances. Soon, however, a signal was made for more line, and as Mr Scoresby was pushing with his utmost speed, four oars were raised in signal of the greatest distress. The boat was now seen with its bow on a level with the water, while the harpooner, from the friction of the line, was enveloped in smoke. At length, when the relief was within a hundred yards, the crew were seen to throw their jackets upon the nearest ice, and then leap into the sea; after which the boat rose into the air, and, making a majestic curve, disappeared beneath the waters with all the line attached to it. The crew were saved. A vigorous pursuit was immediately commenced; and the whale, being traced through narrow and intricate channels, was discovered considerably to the eastward, when three harpoons were darted at him. The line of two other boats was then run out, when, by an accidental entanglement, it broke, and enabled the whale to carry off in all about four miles of rope, which with the boat were valued at £150. The daring fishers again gave chase; the whale was seen, but missed. A third time it appeared, and was reached; two more harpoons were struck, and the animal, being plied with lances, became entirely exhausted, and yielded to its fate. It had by that time drawn out 10,440 yards, or about six miles of line. Unluckily, through the disengagement of a harpoon, a boat and thirteen lines, nearly two miles in length, were detached and never recovered.

Whale-fishers sometimes meet with agreeable surprises. The crew of the ship Nautilus had captured a fish, which being disentangled and drawn to the ship, some of them were employed to haul in the line. Suddenly they felt it pulled away as if by another whale, and having made signals for more line, were soon satisfied, by the continued movements, that this was the case. At

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length a large one rose up close to them, and was quickly killed. It then proved that the animal, while moving through the waters, had received the rope into its open mouth, and struck by the unusual sensation, held it fast between its jaws, and thus became an easy prey.—A Hull ship, the Prince of Brazils, had struck a small fish, which sunk apparently dead. The crew applied all their strength to heave it up; but sudden and violent jerks on the line convinced them that it was still alive. They persevered, and at length brought up two in succession, one of which had many turns of the rope wound round its body. Having been entangled under water, it had, in its attempt to escape, been more and more implicated, till, in the end, it shared the fate of its companion.

A view of the whale-fishery, as it existed prior to 1820, has thus been drawn from ample and authentic materials afforded by the Dutch and other early writers, as well as by the valuable work of the younger Mr Scoresby. Having understood, however, that the trade had been turned into several new channels, we applied in 1834 to certain intelligent individuals at the principal ports, from whom we obtained such valuable information as enables us to continue to that period the history of its operations. We can now add some recent information, which will bring it down to the end of 1844.

Remarkable changes have lately taken place as to the waters in which the fishery is carried on. For more than a hundred years it was confined to the sea between Spitzbergen and Greenland; but early in the eighteenth century Davis' Strait began to be frequented, and the ships sent thither gradually increased in number. A somewhat more ample return, in fact, was drawn from those western seas, though Mr Scoresby conceives that the longer and more expensive voyage, and the increased hazards, fully counterbalanced this advantage. At the time he wrote, the Greenland fishery was still the more considerable, and the ships proceeding thither were in the proportion

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of three to two. Since that period, however, the whales, which during the course of two centuries had been gradually retiring from place to place, sought refuge in the remoter depths of the Icy Sea.—Hence this fishery was almost abandoned,—having employed in 1829 only one vessel; in 1831, the number was increased to nineteen, but in the succeeding year it declined to three; and in 1835 was again reduced to one. To compensate for the loss of their original ground, the whalers have had a more extensive field opened up to them on the western coast. The important expeditions sent out by government under Ross and Parry have made them acquainted with a number of admirable stations on the farther side of Davis' Strait and in the higher latitudes of Baffin's Bay, which were before little known and scarcely ever frequented.

The vessels destined for that quarter sail usually in March, though some delay their departure till the middle or even the end of April. They proceed first to the northern parts of the coast of Labrador, or to the mouth of Cumberland Strait, carrying on what is called the South-west Fishery. After remaining there till about the beginning of May, they cross to the eastern shore of the strait, and fish upwards along the coast, particularly in South-east Bay, North-east Bay, Hingston Bay or Horn Sound. About the month of July they usually cross Baffin's Bay to Lancaster Sound, which they sometimes enter, and occasionally even ascend Barrow's Strait twenty or thirty miles. In returning, they fish down the western shore, where their favourite stations are Pond's Bay, Agnes' Monument, Home Bay, and Cape Searle. If the ships be not previously filled, they commonly remain till the end of September, and in some instances persevere till late in October. Our informant at Peterhead mentions a vessel from that port which was *clean* on the last day of September; yet the captain proceeded with such spirit and resolution that after this date he caught five whales, making his cargo equal to the aver-

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age of the year, and reached home by the 27th of the following month.

This fishery has always been subject to remarkable casualties, which have been still farther increased since the vessels took a wider range, and ventured into the higher and more frozen latitudes. Our correspondent at Aberdeen states that,—

In 1819, out of 63 ships there were lost 10
... 1821, ... 79 11
... 1822, ... 60 7

These wrecks have generally occurred in attempting to pass from the eastern coast to Lancaster Sound, across that great barrier of ice which fills the centre of Baffin's Bay. The sides of the vessels have sometimes been crushed together; at other times they have been pressed out of the water and laid upon the ice. But experience seems to have enabled the mariners to guard in some degree against these dangers. In 1829, of eighty-eight ships only four were lost; namely, the Dauntless, Bramham, of Hull; the Rookwood, Lawson, of London; the Jane, Bruce, of Aberdeen; the Home Castle, Stodart, of Leith.

Several of these shipwrecks have been attended with very peculiar circumstances. In 1825, the Active, Captain Gray, of Peterhead, was so completely beset in Exeter Sound, that on the first October the crew were obliged to abandon her and take a passage in other ships. Next year a vessel, sent out to ascertain her fate, found her on the beach, at a little distance from the place of besetment, completely uninjured. She was got off in a few days, and brought home with her cargo to Peterhead, where she arrived on the 12th September.

In 1826, the Dundee, Captain Dawson, of London, having ventured into the higher parallels of Baffin's Bay, was in latitude 74° 30′ so completely enclosed, that the crew could obtain no assistance from the other ships.

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To add to their distress, a Dutch vessel near them was completely wrecked; and the men, to the number of forty-six, came on board entirely destitute. They were supported from the 23d August to the 6th October, when they set out in their boats to endeavour to reach the Danish settlement of Levely; but, as this was 350 miles distant, much doubt was entertained whether they would ever arrive at their destination. The crew of the Dundee, reduced to extreme distress by the want of provisions, succeeded in killing some seals and bears, on whose coarse flesh they were thankful to sustain life. On the 1st February they caught a whale, and on the 16th a second, which afforded great relief, especially as other fishes were attracted by the desire to feed on the carcass of this huge animal. Unfortunately for their repose, the sea was not so completely frozen but that enormous icebergs were still tossing through it with thundering noise, tearing up the fields by which the ship was surrounded. On the 22d February, one of uncommon magnitude was seen bearing directly upon their stern, its collision with which appeared inevitable; whereupon the seamen, snatching their clothes, leaped out upon the ice, and ran to some distance. The iceberg rolled on with a tremendous crash, breaking the field into fragments, and hiding from their view the ship, which they expected never to see again; but happily it passed by, and the Dundee appeared from behind it uninjured,—a spectacle that was hailed with three enthusiastic cheers. The mariners lost sight of the sun for seventy-five days, during which they suffered such severe cold that they could not walk the deck for five minutes without being frost-bitten. Luckily they were able to pick up a quantity of spars and staves belonging to the Dutch wreck, which afforded a supply of fuel, otherwise they must have perished from the intensity of the frost. By great good fortune, too, the body of ice in which they were enclosed drifted to the southward more than eleven degrees (from 74° 30′, down to 63°), or about 800 miles, and was thus brought nearly to the

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mouth of Davis' Strait. On the 1st April, when the Lee, Captain Lee of Hull, had just commenced her fishing, the crew were agreeably surprised by meeting the Dundee, whose catastrophe had excited the greatest interest at home; they supplied her liberally with provisions, and every necessary for enabling her to reach Britain. She accordingly got free of the ice on the 16th April, and on the 2d June arrived on the coast of Shetland, whence intelligence was immediately spread of her happy escape.

Finally, the whale-fishery deserves to be considered in its commercial relations, under which aspect it possesses considerable importance, whether we consider the large capital invested, or the amount and value of the proceeds.

The principal employment of funds in this trade consists in the construction and fitting out of the vessels adapted for its various purposes. This expense greatly exceeds that required for other ships of the same dimensions, owing to the manner in which the timbers must be doubled and fortified, the necessity of having seven boats, a copious supply of line, numerous casks, and fishing implements. Mr Scoresby states, that the Resolution, of 291 tons, was built in 1803 with all these equipments, but without the outfit for a voyage, at £6321. In 1813 the Esk of Whitby, of 354 tons, cost £14,000; but this included the outlay for her first adventure, which, being supposed to amount to £1700, would make the original expense only £12,300. The sum of £14,000 is stated to us from Hull as the estimate for building and furnishing at that port a ship of 350 tons in the year 1812. Since that period a great reduction has taken place. Mr Cooper, in 1824, reported to the House of Commons that the sum required was only £10,000; and according to the information received in July 1830 from the different ports, we found that such a ship could then be built and completely equipped for about £8000. A Dundee correspondent calculates that half of this amount is expended in carpenter-work, and

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the remainder in sails, rigging, casks, lines, and other apparatus.

Besides this original cost, a large annual expenditure is incurred in the prosecution of the fishery. There is first the outfit, being the provisions and other supplies put on board before the ship goes to sea. Mr Scoresby estimates the expense of fitting out the Resolution, in 1803, at £1470,—namely, provisions, coals, and similar necessaries, £769; insurance, £413; advance-money to seamen, £288. The statements forwarded, at the date mentioned above, from the several ports, vary in a remarkable degree. At Leith the amount is from £700 to £1200; at Aberdeen, £1400; at Peterhead, from £1200 to £1500; while at Hull it is reckoned at £2000, exclusive of seamen's wages. Probably there may be some difference as to the articles comprehended in these calculations. An English crew, besides, may expect to be more amply provisioned, while the voyage from Hull is undoubtedly somewhat longer. To this first outlay must be added the contingencies occurring in the different stages of the fishery, as well as in preparing the cargo for sale. The pay of the master and harpooners depends almost entirely upon their success, as they receive a certain sum for every whale struck, and afterwards for every tun of oil extracted: the seamen also, though they must have their monthly wages, obtain additional allowances in the event of a prosperous voyage. At Peterhead, it is estimated that, if a ship comes home *clean*, the entire loss will exceed £2000; while at Hull the total expense of a voyage, producing 200 tuns of oil, is considered to be £3500 exclusive of insurance.

The produce of the fishery consists of oil and whalebone; none of the other articles, in an estimate of this kind, being worthy of much consideration. The prices of these two commodities vary greatly, both at different periods and from one year to another.

Whale-oil, in 1742, is stated to have sold for £18 per tun; but in the following year it fell to £14. In 1801

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it rose so high as £50; but in 1802 was only £31; and in 1807 had sunk so low as £21. In 1813 it reached a higher price than ever, the finest quality being sold at £60; but the prosperous fishery of 1814 brought it down again to £32. Mr Scoresby reckons the average of the nineteen years ending with 1818, at £34, 15s.; while an intelligent correspondent at Aberdeen stated that of the twenty preceding at £28, 15s. The price in July 1830 was given in the Scotch ports at from £24 to £26; in Hull at £24. Since that time it has run nearly between £25 and £30; which last rate for the last two or three years has been fully supported.

Whalebone bore anciently a very high price, when the rigid stays and expanded hoops of our grandmothers produced an extensive demand for this commodity. The Dutch have occasionally obtained £700 per ton, and were accustomed to draw £100,000 annually from England for that one article. Even in 1763 it brought £500; but it soon fell, and has never again risen to the same value. During the present century the price has varied between £60 and £300, seldom falling to the lowest rate, and rarely exceeding £150. Mr Scoresby reckons the price in the five years ending 1818 at £90; while in July 1830, it was stated from the different ports to be from £160 to £180. The average price of the twenty years to 1834 was estimated at £163. The rate in 1844 is reported to us at £300. This is for what is called the *size*-bone, or such pieces as measure six feet or upwards in length; those below this standard are usually sold at half-price. It may appear singular that whalebone should rise while oil has been so decidedly lowered; but the one change, it is obvious, has really caused the other. Oil being the main product of the fishery regulates its extent, which being diminished by the low price, the quantity of bone is lessened, while the demand for it continuing as great as before, the marketable value consequently rises.

The whale-fishery, for one ship and one season, is a complete lottery, the result of which, according to the

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skill and good fortune of the persons employed, fluctuates between a large profit and a severe loss. Sometimes a vessel is so unlucky as to return *clean;* another brings only one fish; while no fewer than eight or nine of these, producing about ninety tuns of oil, are necessary to make an average voyage. But there are many instances of a much larger produce. The greatest cargo ever known by Mr Scoresby to have been brought from the northern seas was that of Captain Souter, of the Resolution of Peterhead, in 1814. It consisted of forty-four whales, yielding 299 tuns of oil, which, even at the reduced rate of £32, sold for £9568, raised by the whalebone and bounty to about £11,000. In 1813, both the elder and younger Mr Scoresby secured cargoes, less in quantity indeed, but which, from the oil selling at £60 per tun, yielded a still larger return. The former, in the course of twenty-eight voyages, killed 498 whales, whence were extracted 4246 tuns of oil, the value of which and of the bone exceeded £150,000.

The Dutch have published tables, exhibiting the results of their fishery for the space of 107 years, between 1669 and 1778,* both inclusive. During that period they sent to Greenland 14,167 ships, of which 561, or about four in the hundred, were lost. They took 57,590 whales, yielding 3,105,596 quardeelen† of oil, and 93,179,860 pounds of bone, which sold for £18,631,292.‡ The expense of fitting out the ships amounted to £11,879,619; the value of those lost was £470,422; and the expense of preparing the oil and bone was £2,567,109,—total expenses, £14,917,150; leaving a profit of £3,714,142. The Davis' Strait fishery, between 1719 and 1778, employed 3161 vessels, of

* The years 1672, 1673, and 1674, are not included, the war with France having caused a suspension of the fishery.

† A quardeel of oil contains from 18 to 21 stekans, or from 77 to 90 imperial standard gallons; and 100 Dutch pounds are equal to 109lbs. avoirdupois nearly.

‡ In converting the Dutch estimates into English money, the florin is valued at 20½d. sterling.

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which 62 were lost. The produce was £4,288,235, which, deducting £3,410,987 of expenses, left a profit of £877,248. The Greenland fishery would thus have yielded a profit of about 25 per cent., and the Davis' Strait of about 26 per cent.; but it may be observed that the Dutch, in their estimate of expenses, have not included the original cost of the vessels. From 1785 down to 1794, the number of ships was reduced to sixty, and the trade is said to have been carried on with absolute loss.

The British fishery for some time yielded a produce much exceeding in value that of the Dutch even during the period of its greatest prosperity. In the five years ending with 1818, there were imported into England and Scotland 68,940 tuns of oil, and 3420 tons of whalebone; which, valuing the oil at £36, 10s., and the bone at £90, with £10,000 in skins, raised the whole to £2,834,110 sterling, or £566,822 per annum. The fishery of 1814, a year peculiarly fortunate, produced 1437 whales from Greenland, yielding 12,132 tuns of oil, which, added to the produce from Davis' Strait, formed altogether, even at comparatively low prices, a value of above £700,000.* It may be mentioned that this trade is now carried on without legislative encouragement, no bounty having been granted since the year 1824.

There has also been a somewhat singular change as to the ports in which the fishery is pursued. In London were undertaken all the discoveries which led to its establishment; and for some time a complete monopoly was enjoyed by the great companies formed in that city. Even between the years 1780 and 1790, the metropolis sent out four times the number of vessels that sailed from any other town. It was observed, however, that her efforts were on the whole less fortunate than those of the rivals who had sprung up; and her merchants

* In all these statements the measure employed is the tun of 252 old wine gallons, equal to $209\frac{2}{10}$ Imperial standard gallons.

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were so much discouraged that, in Mr Scoresby's time, they equipped only seventeen or eighteen vessels. They have since entirely abandoned the trade, employing in 1827 no more than two ships, in 1835 only one; at present none. Hull early became a competitor with the capital, having sent out vessels from the very commencement. Although checked at first by the influence of the privileged bodies, as soon as the trade became free she prosecuted it with distinguished success. In the end of the last century that town attained, and for forty years preserved, the character of the first whale-fishing port in Britain. Since 1837 it declined so much as to send in 1842 only two vessels. The two following years, however, showed a great revival. Whitby engaged in this pursuit in 1753, and carried it on for some time with more than common fortune; but her operations have since been discontinued. Liverpool, after embarking in the undertaking with spirit, has now entirely relinquished it. Newcastle, though much declined, still carries on a moderate trade. Meantime the eastern ports of Scotland gradually extended their transactions, while those of the country at large were diminishing. The increase was most remarkable at Peterhead; and indeed this place, compared especially with London, must derive a great advantage from avoiding, both in the outward and homeward voyage, 600 miles of somewhat difficult navigation. It is now decidedly the chief port in the United Kingdom. Leith, Montrose, and Aberdeen, after starting with spirit, entirely withdrew, though the last again sent a vessel in 1844. Dundee, and on a smaller scale Kirkcaldy, have kept up a steady trade; while Bo'ness also despatches one vessel.

The following summary has been collected from Mr Scoresby's work, as the average quantity of shipping fitted out in the different ports for nine years ending with 1818; since which time it will appear hereafter that the amount has considerably declined.

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		Average of 1810-18.
England,—	Berwick	1 1/2
	Grimsby	1 1/2
	Hull	53 1/2
	Liverpool	1 1/2
	London	17 1/2
	Lynn	1 1/2
	Newcastle	4 1/2
	Whitby	8 1/2
		91 1/2
Scotland,—	Aberdeen	10 1/2
	Banff	1/2
	Dundee	7 1/2
	Greenock	1/2
	Kirkcaldy	1/2
	Kirkwall	1/2
	Leith	8 1/2
	Montrose	2 1/2
	Peterhead	6 1/2
		40 1/2
	Total	131 1/2

The year 1830 was the most disastrous that ever occurred in the annals of British fishery. Melancholy as the details are, they possess a deep interest, and may afford useful lessons to future navigators; we have therefore taken some pains to procure such materials as might enable us to exhibit, in a full and connected view, the occurrences of this calamitous season. We consider ourselves particularly fortunate in having obtained journals, written by individuals who were present at the different scenes of shipwreck; and these not only give a minute detail of the events, but forcibly represent the emotions which the view of them excited. A variety of interesting documents have also been received, from intelligent friends at the respective fishing-ports, in reply to queries transmitted to them on the subject.

In tracing the causes of these dreadful disasters, it will be necessary to explain the manner in which masses of ice are formed, and the positions they occupy

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in that extensive inlet, to the successive parts of which we give the names of Davis' Strait and Baffin's Bay. This sea, though not constituting, as was once supposed, a completely enclosed gulf, has yet no opening so wide as materially to interrupt the continuity of its shores on either side. Ice of a certain description may cover the greatest expanse of water; but every one knows that it is formed most extensively, and of the most compact texture, in bays and along a precipitous beach. The winding and generally elevated coast of this strait has always produced it in the greatest varieties, among which those of bergs and floes have been most conspicuous. The land-ice, during the rigour of winter, remains fixed in an unbroken sheet, stretching many miles out to sea. Under the warmth of spring and early summer, numerous fragments are detached, which, through the action of tides and currents, are floated out into the ocean, and sometimes reach even low latitudes on the shores of America. The greater proportion, however, coming from the opposite coasts, meet in mid-channel, and unite into a compact and continuous barrier, through which, till a very advanced period of the season it is impossible for the navigator to penetrate. Between this central body, called the middle-ice, and that attached to the land, there intervenes a narrow and precarious passage, always more or less encumbered, and often entirely closed up; yet through which the adventurous mariner can generally, in the course of two or three months, wind his course into the higher latitudes in the direction of Lancaster Sound.

Prior to the voyages of Ross and Parry, the range of operations had been limited to the south-west fishery, and to that on the eastern shore as far as Horn Sound. These fields, however, gradually shared the fate of those in the Greenland Sea,—being, as it were, *fished out;* the whales having learnt to take refuge from the destroying power of their assailants in some more distant recesses of the Arctic Ocean. When it was reported, therefore, by the officers employed in discovery, that, on the

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north-western shores of Baffin's Bay, fish had been seen in vast numbers, the spirit of enterprise was kindled, and success soon crowned its efforts. Since that period, not only the Greenland Seas have been nearly deserted, but the original fishing-grounds in Labrador and Davis' Strait have been regarded only as secondary objects; while every nerve has been strained to reach those interior shores, where whales are still found in an abundance elsewhere unexampled.

To arrive at this more important station, the captains may proceed along either of the coasts of that great inland sea. The *western* might appear at first sight the more eligible one, leading most directly to the object, and avoiding that middle barrier which is so peculiarly dangerous. This shore, however, is exposed to the great body of ice, which, at the beginning of the season, floats down from the north, rendering the navigation at once tedious and dangerous. Hence the usual practice among whalers is to work their way up the eastern passage till they turn Cape York; beyond which the sea becomes much narrower, the central ice usually terminates, and an opening is found stretching to the western side. Before reaching Cape York, however, and after passing that formidable promontory called the Devil's Thumb, they must cross the spacious expanse of Melville Bay, bounded on the north by a bold shore, covered with perpetual ice and snow. Here those dangers occur which have proved fatal to so many navigators. A strong wind from the south-west loosens the ice, and drives its severed fragments directly into the bay just specified. Arrested by its northern boundary, these are crowded together, and tossed with a violent commotion, which involves the mariner in the most deadly peril. This place, accordingly, was almost exclusively the scene of the calamitous shipwrecks in 1830, which are now to be described.

Most of the vessels destined for the fishery that year sailed between the middle and end of March; but, having a tedious voyage out, they did not reach the en-

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trance of Davis' Strait till the close of April. This delay, chiefly occasioned by the prevalence of adverse winds attended with rain, also prevented many of them from crossing over to Labrador, and attempting the south-west fishery. They proceeded, therefore, directly "up the country," as they term it; that is, northward along the eastern coast of the strait; and the sea being remarkably open, and very few whales in sight, they made an uncommonly rapid run. When beyond Disco Island, indeed, they were detained a whole week by the ice; yet, even there, an unusual extent of open water was observed to the westward; seemingly in consequence of the south-westerly gales, which had in a great measure broken up the field in mid-channel, and driven its loosened fragments into a more northerly quarter. We have been informed, that several vessels made an attempt to cross the strait in this latitude, though without success. Working slowly upwards, they at last reached the opening of Melville Bay, where, on the 10th of June, about a month before the usual period, more than fifty sail were assembled. This recess, however, presented a most alarming aspect; being crowded with floes of ice that had been driven in by the winds, and arrested by the rugged margin of the northern shore. If, however, they could by any means reach the western boundary of the ice, they might hope to find an open sea leading directly to the great fishing-ground. With eager impatience, therefore, they looked around for some canals by which they might proceed through it; but they saw only a few lanes, forming narrow and dangerous defiles. It is a maxim, however, that the ship which first reaches the open water is sure of a good fishing; hence an eager emulation is excited, and, as our Peterhead correspondent observes, "when one begins to trip through, all the rest follow." The St Andrew of Aberdeen, accordingly, entered one of these openings which appeared the most promising: twenty-two others imitated her example, and the remaining vessels were eagerly pressing onward, when,

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fortunately for them, two masses of ice closed together and shut them out, barring, at the same time, the return of those that had advanced. These last, separating into groups, took different directions, and made various degrees of progress; a few even came in sight of the open water; but all were finally arrested, and hemmed in by the ice.

One of the largest of these squadrons, and that whose eventful story we can relate in the greatest detail, consisted of six very fine vessels, the St Andrew of Aberdeen, the Baffin and the Rattler of Leith, the Eliza Swan of Montrose, the Achilles of Dundee, and the French ship Ville de Dieppe. They began by making themselves fast to some icebergs, but soon quitted these in order to attempt a passage to the western side. On the 19th a fresh gale sprung up from the S. S. W., and drove in upon them masses of ice, by which they were soon beset, in lat. 75° 10′ N., long. 60° 30′ W., about forty miles to the southward of Cape York. They ranged themselves under the shelter of a large floe, having water barely sufficient to float them. Here they formed a line one behind another, standing stem to stern so close as to afford a continued walk along their decks; being at the same time so pressed against the ice that in some places a boat-hook could with difficulty be inserted in the interval. In the evening of the 24th the sky darkened, the gale increased, the floes began to overlap each other, and closed upon the ships in an alarming manner. The sailors then attempted to saw out a sort of dock, where they hoped to be relieved from this severe pressure; but soon a huge floe was driven upon them with a violence completely irresistible. The Eliza Swan (whose surgeon, Mr Maccall, has also furnished us with some particulars) received the first shock, and was saved only by the ice raising her up. It caused her indeed to strike with such force on the bow of the St Andrew that her mizzen-mast was nearly carried off, after which it passed from under her, after damaging severely her stem and keel. It next struck the St Andrew, midship,

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breaking about twenty of her timbers, and staving a number of casks; but it then fortunately moved along her side, and went off by the stern. Now, however, pursuing its career, it reached successively the Baffin, the Achilles, the Ville de Dieppe, and the Rattler, and dashed against them with such tremendous fury that these four noble vessels, which had braved for years the tempests of the Polar deep, were in a quarter of an hour shattered into fragments. The scene was awful,—the grinding noise of the ice tearing open their sides; the masts breaking off and falling in every direction; were added to the cries of two hundred sailors leaping upon the frozen surface, with only such portions of their wardrobe as they could snatch in a single instant. The Rattler is said to have become the most complete wreck almost ever known. She was literally turned inside out, and her stem and stern carried to the distance of a gunshot from each other. The Achilles had her sides nearly pressed together, her stern thrust out, her decks and beams broken into innumerable pieces. The Ville de Dieppe, a very beautiful vessel, though partly filled with water, stood upright fourteen days, and the greater part of her provisions and stores were saved; as were also some belonging to the Baffin, two of whose boats were squeezed to pieces. All the other boats were dragged out upon the ice, and were occupied by the sailors as their only home. Not far from the same spot the Progress of Hull was crushed to atoms by an iceberg on the 2d of July; and on the 18th of the same month, the Oxenhope, also of that port, became a total wreck.

The Resolution of Peterhead, Laurel of Hull, Letitia and Princess of Wales of Aberdeen, had advanced considerably farther to the north-west, being in lat. 75° 20′ N., long. 62° 30′ W. They were lying side by side, and, having cut out a dock in the ice, considered themselves perfectly secure. But the gale of the 25th drove the floes upon them with such fury that the sides of the two first were pierced; and being filled with water to the deck, were pressed so forcibly against the Laurel,

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which lay between them, as almost to raise that vessel out of the water. This last, however, remained for the present in safety, and the seamen busied themselves in carrying on board of her the provisions and stores of her two wrecked companions. But, on the 2d of July, she, along with the Hope of Peterhead, was exposed to a gale if possible still more terrible than the former, when they both shared the fate of the Resolution and Letitia. The Hope, which was standing in the water clear and secure, was overwhelmed with such rapidity that in ten minutes only the point of her maintop-gallant-mast was seen above the ice.

The tempest, on the 26th June, assailed also the Spencer and the Lee, which had penetrated farther north than any of the other vessels, having reached the latitude of 76°. The latter escaped with only a number of her timbers shattered; but the former, after a long and vigorous resistance, had her hold burst open and filled with water, so that she soon became a complete wreck. Sufficient warning, however, had been given to enable the sailors to lodge on the ice their most valuable effects. In this vicinity the William and Ann of Whitby and the Dordon of Hull were attacked at the same moment. The latter, fortunately, was raised up by the pressure of the ice into a safe position; but the other being exposed to the action of two opposite floes, was crushed to pieces so rapidly that nothing could be saved out of her; and a boat, into which the captain had thrown a few articles from the cabin-windows, was itself soon afterwards sunk. In the same latitude, a few miles to the westward, the tempest also proved fatal to the Old Middleton of Aberdeen.

A similar disaster befell part of a large group, amounting to twenty-two sail, which had not entered the ice, but remained considerably to the southward, in about lat. 74° 20′ N. They seem scarcely to have felt the storm of the 25th June, and remained in tolerable safety, though beset, till the night of the 30th. A

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heavy gale then sprung up, and increased continually till the morning of 2d July, when it swelled to a frightful tempest. The howling of the wind, the showers of hail and snow, the dark and fearful aspect of the sky, gave warning of approaching danger. At seven in the morning a signal of distress was hoisted by the William of Hull, and in a short time thereafter she appeared almost buried under masses of ice. About ten the North Briton was reduced to a complete wreck; and at eleven the Gilder was in a similar predicament. During six hours the storm slightly abated, but returning after that interval with augmented fury, pressed the ice with additional force upon the Alexander of Aberdeen and the Three Brothers of Dundee,—two fine vessels, so strongly built that an observer might have supposed them capable of withstanding any shock whatever. They made accordingly a very stout resistance; the conflict was dreadful, and was beheld with awful interest by the sailors as they stood round: at length their timbers gave way at every point,—the sides bursting open, the masts crashing and falling with an astounding noise; the hull of the Three Brothers was so much twisted that the two ends of the ship could scarcely be distinguished: finally, only some broken masts and booms appeared above the ice. The crews, spectators of this awful scene, gave three cheers in honour of the gallant resistance made by their vessels to the overpowering element by which they had been vanquished. Our correspondent here observes,—somewhat as Captain Parry had already done at a critical period,—that a ship, even the strongest which human art can construct, becomes like an egg-shell when opposed to the full force of this terrific agent.*

It is a gratifying circumstance that, in the whole of

* The shipwreck of these vessels is well represented in a lithographic print, from a drawing by Mr Laing, surgeon to the Zephyr of Hull. To this gentleman, as well as to Mr Alexander, surgeon to the Three Brothers of Dundee, we have to acknowledge ourselves indebted for some useful information.

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these sudden and dreadful disasters, there should not have occurred the loss of a single life. The very element, indeed, which destroyed the vessels, was in so far propitious, as it afforded to the crews a secure though uncomfortable retreat. By leaping out upon the ice in the moment of wreck, they all effected their escape, though we have heard of several instances in which the danger was almost inevitable. Sometimes the seamen, before they could snatch their clothes and bedding, found themselves up to the middle in water. The surgeon of the North Briton beheld the ice rushing in and meeting from opposite quarters in the cabin, before he was able to make his retreat.

The shipwrecked mariners, nearly a thousand in number, were now obliged to establish temporary abodes on the surface of that rough and frozen sea where their ships had been destroyed. They erected tents of sails detached from the broken masts; they kindled fires, and procured provisions, either out of their own shattered vessels, or from those of their companions which had happily escaped. But still their situation, though not desperate, was dreary in the extreme; producing the feeling that they were like outcasts in the most desolate region of the earth, without any assured means either of subsistence or return. Yet such is the elastic spirit of British tars, that, as soon as the first shock was over, they began with one consent to enjoy themselves, exulting in the idea of being their own masters. Finding access, unfortunately, to considerable stores of wine and spirits, they began a course of too liberal indulgence. The rugged surface of the Arctic deep was transformed into a gay scene of festivity. The clusters of tents with which it was covered, the various scenes of ludicrous frolic, the joyous shouting of our sailors, and the dances and songs of the French, suggested the idea of a festival; some even gave it the name of Baffin Fair. The Frenchmen declared that they had never been so happy in their whole lives. Excursions of considerable extent were made over the ice from one party to another; a communication was

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even opened between the northern and southern detachments of the fleet, and so regularly carried on as to be called by the latter the "north mail."

A few days after the different shipwrecks, the seamen, in almost every instance, proceeded to a very extraordinary operation,—that of setting fire to the vessels, and burning them down to the water's edge. The object was, that, when the upper surface of the ship was thus removed, the casks and chests containing the clothes and provisions might float. A sailor, who witnessed this operation with the first four wrecks, describes it as having completely answered its purpose. Others deprecated the practice as causing a very wanton destruction of property, which might have been preserved for the use, at least, of other crews. The ships were for some time borne up on the surface by the ice on which they rested; but when it was melted, they sunk and disappeared, and the waves were then strewed with floating fragments of every shape and size,—blocks, chests, casks, ropes, shattered pieces of masts and yards, and timber of all dimensions.

We have already noticed the pleasing circumstance that, in the first awful catastrophe of the vessels, there was not a single life lost; but we must add that a few died afterwards in consequence of fatigue and exposure to cold. Several also perished in excursions over the ice, particularly in one undertaken by the captains of the Laurel, Letitia, and Progress. Not finding sufficient room in the Bon Accord, where the shipwrecked crews had been received, they departed in search of some other vessel which might have more accommodation. The three masters carried merely their clothes, and after travelling a direct distance of twenty miles, much increased by the circuitous track they were obliged to follow, they reached the ships Dee and Mary Frances, into which they were kindly received. But the seamen imprudently encumbered themselves with a boat, which they had frequently to drag over the ice: they thus

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spent a much longer period, and exposed themselves to such severe cold that five of them died; while others, reduced to a most distressing state, were recovered only by the extreme care with which they were treated. With regret we must subjoin, that some deaths appear to have arisen from the too free use of intoxicating liquors. A certain quantity, indeed, was rendered necessary by fatigue and cold; but that measure was greatly exceeded; and in passing over the icy surface, which was at once very rugged, and filled with various holes and crevices, several plunged in to rise no more. One man expired of mere intoxication. Yet it is satisfactory to add, amid these irregularities as well as the thoughtless gayety which every where prevailed, that, whenever the exertions of the sailors were required for the general service, the utmost activity was manifested, and complete subordination observed.

After these disasters, the ships remained still closely beset, and their situation became the subject of a daily increasing anxiety. They had gone out wholly unprovided for wintering in the Arctic zone; while the extensive loss of provisions and fuel, with the numerous crews crowded on board the ships, rendered the prospect still more gloomy and doubtful. On the 21st July, in consequence of some favourable appearances, the St Andrew, Eliza Swan, and other ships on the northern station, determined to attempt penetrating to the westward. The men, though quitting the scene of gayety which they had formed for themselves, obeyed the summons with much alacrity. In a few minutes the tents were struck, the crews of the wrecked ships were distributed among the surviving ones, and all hands began towing forward the vessels. They separated in various directions; but some, being driven considerably to the northward, were so long detained, that they repeatedly lost all hope of ever effecting their extrication. The men caught and dragged a few whales through holes in the ice; but one harpooner relates, that these animals were so extremely vigilant that

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he could effect nothing unless he approached them without his shoes, and thus prevented an alarm. September arrived, and the ice was forming so rapidly, that in two days a place where a boat could have sailed might be safely walked over. The St Andrew and several other vessels had been driven about thirty miles N. W. of Cape Dudley Digges, into lat. 76° 2′ N., long. 68° 46′ W. At last, after much laborious sawing and towing, they succeeded, on the 10th of September, in making their way into open water. Most of those which had taken a more southern direction reached the western coast towards the close of August, and in lat. 71° N.

The feelings excited at home by the intelligence of these unparalleled misfortunes may be more easily conceived than described. The appearance, each successive year, at the great ports, of the first vessel returning from the fishery, is, in all cases, attended with deep interest and anxiety; and this season, in consequence of the long delay, these emotions had been wound up to an intense pitch. The tidings were brought to Peterhead, on the 8th October, by the James, Captain Hogg; and to Hull, on the 10th, by the Abram, Captain Jackson. Our correspondents describe, in the strongest terms, the universal gloom that overcast these towns; the eager throng which besieged the houses of the captains, and every place where information could be hoped for; as also the alarm of the females, making hasty inquiries after their brothers and husbands, to which only doubtful answers could be returned. It was a scene of public and general calamity. The news being conveyed to Aberdeen by the next day's mail, spread equal consternation in that city. A subscription was opened at Hull on behalf of the seamen, many of whom were exposed to great distress, in consequence of their pay having been stopped from the period at which the wreck of their vessels took place.

The following list contains the entire number of ships which were lost in this disastrous year:—

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			Tons.
Aberdeen,	4.	Alexander	252
		Letitia	318
		Old Middleton	329
		Princess of Wales	308
Hull,	6.	Gilder	360
		Laurel	321
		North Briton	262
		Oxenhope	286
		Progress	307
		William	350
Leith,	2.	Baffin	321
		Rattler	348
Dundee,	2.	Achilles	367
		Three Brothers	339
Peterhead,	2.	Hope	251
		Resolution (Philip)	400
Whitby,	1.	William and Ann	362
Montrose,	1.	Spencer	340
Greènock,	1.	John	316
Dieppe,	1.	Ville de Dieppe	400

The amount of the loss occasioned by these shipwrecks is estimated as follows:—

Value of 19 British ships, including stores, &c., average £5000	£95,000
Value of outfit, provisions, and wages, £2000	38,000
Twelve damaged; repairs of each cost on an average £800	9,600
	£142,600

A still severer loss was sustained in the great failure of the produce, very imperfectly compensated by a rise of the oil and whalebone to more than double the former price.

The following table, derived from sources which may be fully relied upon, exhibits a complete summary of the results of the whale-fishery during the twenty years from 1815 to 1834 inclusive:—

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Number of Ships sent to Greenland and Davis' Strait.			Total Ships.	Total Tonnage.	Total Ships Lost.	Total Tuns of Oil.	Total Tons of Bone.	Number of Whales.	Tuns of Oil for each Ship sent out.	Tuns of Oil in each Whale.	Extreme Prices of Oil in Glasgow per Tun.	Extreme Prices of Bone in London per Ton.
Year.	G.	D. S.										
1815	98	48	146	47,148	1	10,682	528	733	73	14½	£33 to £50	£65 to £120
1816	101	45	146	46,868	1	13,590	632	1,330	93	10	27 35	60 85
1817	97	53	150	48,084	5	10,871	539	828	72⅔	13¼	30 56	60 90
1818	94	63	157	50,362	2	14,482	666	1,208	92¼	12	35 58	65 80
1819	96	63	159	51,082	12	11,401	517	988	71¾	11⅓	31 40	70 80
1820	102	57	159	50,546	3	18,745	946	1,595	118	11¾	23 35	65 72
1821	80	79	159	50,709	14	16,853	923	1,405	106	12	20 25	70 88
1822	61	60	121	38,144	8	8,663	422	630	71½	13¾	20 29	210 235
1823	55	62	117	36,759	3	17,074	921	2,018	146	8½	17 26	130 160
1824	32	79	111	35,013	1	9,871	534	761	89	13	17 28	190 200
1825	21	89	110	34,751	5	6,370	350	500	58	12¾	24 36	250 310
1826	5	90	95	30,414	5	7,200	400	512	75⅔	14	24 35	255 315
1827	16	72	88	28,273	1	13,186	733	1,162	149¼	11⅓	18 24	170 220
1828	10	79	89	28,665	3	13,966	802	1,197	157	11¾	18 23	205 220
1829	1	88	89	28,812	4	10,672	608	871	120	12¼	22 25	200 210
1830	—	91	91	29,460	19	2,205	119	161	24½	13⅔	30 55	360 400
1831	8	80	88	28,608	3	5,104	273	454	56	11¼	26 35	180 210
1832	19	62	81	26,393	5	12,610	676	1,563	155⅔	8	18 22	100 170
1833	3	74	77	25,294	1	14,508	802	1,695	188⅓	8½	18 20	100 165
1834	7	69	76	24,955	3	8,214	442	872	108	9½	18 23	130 150
Yearly Average,			115½	37,017	5	11,313½	591¾	1,024½	101⅓	11¾	—	—

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The following statement of the results for 1834 shows the ports from which the fishery was carried on :—

Ships.	Tonnage.	Fish.	Oil.	Bone.	
			Tuns.	Tons.	Cwts.
27, Hull	8906	273	2696	146	10
2, Whitby	723	16	149	8	—
3, Newcastle	1131	25	283	17	4
1, Berwick	310	34	220	11	3
3, London	953	22	173	9	2
3, Montrose	962	20	144	7	17
11, Peterhead	3076	99	1093	57	15
6, Aberdeen	1979	72	801	45	9
8, Dundee	2789	115	1036	53	10
5, Kirkcaldy	1591	92	743	38	6
2, Burntisland	688	25	177	9	10
5, Leith	1847	79	699	37	4
76	24,955	872	8214	441	10

The fishery of 1835 was very disastrous, no less than six vessels being lost, though the crews were fortunately saved. Since that time the trade, which had already experienced a diminution, rapidly declined, till in 1842 only eighteen ships were sent out. In 1843 and 1844, however, it rallied considerably. There has been a certain return to the Greenland seas, which from 1833 to 1836 had been nearly deserted. Another novel feature is the fitting out of vessels entirely for the Greenland seal-fishery, where the vast number of those animals compensates for the small quantity of oil in each. Some endeavour to combine both objects.

The following general view of results from 1835 to 1842 inclusive, is derived from the truly valuable Commercial Dictionary of Mr M'Culloch :—

Years.	Ships.				Whales caught.	Imperial Tuns of Oil.	Price.	Tons of Whalebone.
	Greenland.	Davis' Strait.	Total.	Lost.				
1835	1	70	71	6	167	2623	£28	—
1836	3	58	61	2	70	707	32	—
1837	15	37	52	2	122	1356	35	65
1838	31	8	39	1	466	4345	25	236
1839	29	12	41	–	115	1441	25	79
1840	11	20	31	2	22	412	25	14
1841	11	8	19	–	52	647	31	22
1842	14	4	18	–	54	668	30	—

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The following details for 1843 have been communicated to us by an intelligent correspondent:—

Ports.	Ships.						Whales caught.	Seals.	Tuns of Oil.	Whalebone.	
	Davis' Strait.	Greenland. Whale.	Greenland. Seal.	Total.	Tonnage.	Lost.				Tons.	Cwts.
Hull	2	1	2	5	1353	–	26½	3,625	300½	14	17
Newcastle	2	–	–	2	791	–	11	—	132	7	–
Dundee	5	–	–	5	1622	–	41	—	359	22	6
Kirkcaldy	2	–	–	2	746	–	19½	—	154	9	16
Bo'ness	1	–	–	1	322	–	7	—	58	4	3
Peterhead	3	3	3	9	2040	1	41	23,200	648	22	2
	15	4	5	24	6874	1	146	26,825	1651½	80	4

Unfortunately Mr Coltish of Hull, who was accustomed to collect an annual statement of the produce, died in 1844; and no one has undertaken in his stead the same good work. We have thus been able to procure only the shipping and tonnage for that year, which will show a considerable increase over the two preceding.

Ports.	Ships.			Total.	Tonnage.
	Davis' Strait.	Greenland. Whale.	Greenland. Seal.		
Hull	5	3	2	10	2645
Newcastle	2	–	–	2	791
Kirkcaldy	2	–	–	2	696
Bo'ness	1	–	–	1	322
Dundee	5	–	–	5	1622
Aberdeen	1	–	–	1	313
Peterhead	4	5	2	11	2917
	20	8	4	32	9306

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CHAPTER XI.

Arctic Geology.

North Cape—Cherie Island, with its Secondary Sandstones, Coal, and Plutonian Rocks—Hope Island, and the Thousand Islands—Spitzbergen, its Mountain-scenery, its Primitive, Transition, Secondary, Tertiary, and Alluvial Rocks—Moffen Island, of Recent Formation; Low Island, of Transition Formation; Walden Isle, of Primitive Rocks—Ross's Islet, the most northern known Land, composed of Granite-gneiss, with imbedded Precious Garnet—Remarks—Jan Mayen's Island, a Volcanic Island; Two Volcanoes described—Old Greenland—East Coast of Greenland, very wild and rugged—Werner Mountains, 6000 Feet high; Rocks, Primitive, Transition, Secondary, and Plutonian; Of the Secondary Rocks, the most important, as being intimately connected with the Antediluvian Climate of Greenland, are those of the Coal Formation, which Scoresby discovered, forming Jameson's Land—West Coast of Greenland, equally rugged and wild with the East Coast; Hot Spring there; the prevailing Rocks Primitive, containing rare and beautiful Simple Minerals; Transition Rocks seldom met with; Considerable Depositions of Secondary and Tertiary Rocks in some Places—Barrow's Strait—Melville Island interesting to the Geologist, from its containing the old Coal Formation—Port Bowen—Islands and Countries bordering on Hudson's Bay examined and partly discovered by Captain Parry—Concluding Remarks.

The Geology of Spitzbergen, called East or Old Greenland, and the countries examined and discovered by Ross, Parry, Scoresby, and Clavering, although as yet but imperfectly known, is far from being uninteresting. It exhibits, in the first place, the same rocks, and the same

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general arrangements, as occur in other countries the geognostical structure of which has been thoroughly explored: secondly, the fossil organic remains which, in all parts of the world, afford so much information with regard to the ancient condition of the climate, seas, animals, and vegetables of the globe, are not wanting in these remote and desolate regions: and, lastly, the Arctic geology has supplied to the mineralogist specimens of many of the rarer and of some of the more precious minerals and ores:—

1. *North Cape, Cherie Island, Hope Island, the Thousand Islands, Spitzbergen, and Ross's Islet.*

North Cape.—The primitive land of Scandinavia continues onward to the extreme point of Norway; but in this high latitude some new formations make their appearance among the older. The *sandstone-quartz* of Alten has been known since the travels of the celebrated Baron Von Buch; but on the east, towards the Russian dominions, there is a considerable tract which deviates still more from the primitive formation than that sandstone-quartz. *Sandstone* and *conglomerate* extend across the subjacent gneiss in a horizontal position. These secondary rocks probably belong to the old red sandstone formation of some authors. Hence, in Finmark we find ourselves on the edge of a great *secondary basin.*

Cherie Island.—The first land which rises above the level of the ocean in the Arctic Sea, beyond the North Cape, is the insulated spot named Cherie or Bear Island. It is about ten miles long, is situated in latitude 74° 30′, long. 20° east, and is entirely composed of secondary rocks horizontally stratified, which are cut perpendicularly on the coast into cliffs. The principal ingredients are *sandstone* and *limestone*, in which veins of leadglance, or sulphuret of lead, sometimes containing native silver, occur. The limestone abounds in fossil shells, of which the species are very different from those that at present inhabit the surrounding seas: the sandstone contains a bed of *coal*, from two to four feet thick,—a fact subversive of the opinion which maintains that this deposit is

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wanting in Arctic countries. In Scoresby's drawing of Cherie Island three conical hills are represented, which, in all probability, are of igneous origin, probably secondary trap.

Hope Island, and the Thousand Islands.—Farther towards the north the depth of the ocean is so inconsiderable and unvarying that seamen conclude they sail first over the horizontal basis of Cherie Island, and next over those which belong to Hope Island and the Archipelago of the Thousand Islands. The strata visible in these islands are said to consist of *blackish clay-slate. Hope Island*, situate on the south coast of Edge's Island, lies in lat. 76° 20′ N., and longitude 20° E. It is nine leagues long, but scarcely a mile broad, and stretches from N.E. by E. to S.W. by W. It presents five mountains, of which the most northern is the highest; and those succeeding diminish gradually in size. The Thousand Islands constitute a large group interposed between Hope Island and the south coast of that which bears the name of Edge.

Spitzbergen.—This large island, although not the remotest land known in that direction, is nearly so. It lies between latitudes 76° 30′ and 80° 7′ N., and between the longitudes 9° and 22° E. On taking a general view of it, the principal objects that strike the eye are numberless mountain-peaks, ridges, and precipices, rising immediately from the sea to a height of from 3000 to 4500 feet. The various brown, green, and purple tints of the land, as seen from a distance, are strikingly contrasted with the snow-capped summits, and the glacier-ice in the valleys; which last often extends downwards to the coast, forming splendid icy cliffs, from 100 to 400 feet high. On the eastern side are two large islands, namely, *Edge's and North-east Land.*

On approaching the western shore of *Stanforeland*, on the east coast of *Edge's* Island, between the parallels of 77° and 78°, the lowest rock is a coarse *granular trap*, split by means of vertical rents into imperfect columns. This bed forms a flat coast of about ten miles and a

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quarter broad and forty-one miles long; and is the base or fundamental rock of an alternation of *fine granular sandstone*, an arenaceous *marl-slate*, compact *siliceous limestone*, and frequent repetitions of the trap-rock. No organic remains were seen either in the sandstone or limestone by Professor Keilhau; but in some specimens collected at Cape Faneshaw, in that part of Spitzbergen named *New Friesland* by the officers of Captain Parry's expedition, were noticed silicified *madrepores*, *retepores*, *orthoceratites*, *terebratulites*, and *cardites*. This formation extends to latitude 80°, and is conjectured by Keilhau to constitute the greater part of East Spitzbergen. It is true that some boulders of granite were observed; but these may have come from the great primitive chain of West Spitzbergen. Professor Keilhau found an interesting deposit of *shell-clay* in Stansforeland, in which the same kinds of fossil shells were found as in a similar clay on the southern coasts of Norway. This deposit extends onwards nine miles and a half from the shore, and rises 100 feet above the present level of the sea. Bones of whales have been seen in the Thousand Isles, at a considerable height, and probably embedded in this *shell-clay*. Are we to infer, from the situation of this deposit, that Spitzbergen has risen from the bottom of the sea at a comparatively recent period? Limestone, like that at Cape Faneshaw, occurs in the island named the *North-east Land*, on the eastern coast of Spitzbergen. The officers of Captain Parry's expedition also found granite there. The west and north coasts of Spitzbergen are composed principally of older rocks, the primitive and sometimes the transition. The former in West Spitzbergen appear at the *South Cape*, in latitude 76½°. They are vertical strata of mica-slate, with numerous beds of quartz, ranging from north-east to south-west. In *Horn Sound* and *Bell Sound* they form the high land, and to judge from the shape of the mountains, they ascend to a greater elevation on the west coast, while those near South Cape appear in part overlaid with the *shell-clay*. A new formation of red sandstone and gyp-

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sum occurs westward along the shore, and also in small low islands which lie in front of it. In the year 1826 seahorse fishers from Finmark brought *sixty tons of coal* from Ice Sound, in latitude 78°, to Hammerfest in Norway; and we are informed by Scoresby, that this useful mineral is so easily procured that many of the Dutch whalers, a few years ago, were in the habit of laying in a stock for fuel for the homeward passage. In some places it resembles cannel coal; in others it is brown and identifies itself with lignite. At Mitre Cape, about latitude 79°, he observed the hills to be composed of gneiss, mica-slate, and limestone,—and in King's Bay, a little southward of this cliff, he remarked natural arches of marble. In some points on the north coast, as at Red Beach, secondary rocks of red sandstone, probably new red sandstone, occur; but the prevailing ones are of an older date, being principally primitive, with a few of the transition class. The former, mentioned in Parry's narrative, are granite, gneiss, mica-slate, hornblende-slate, primitive limestone or marble, quartz-rock, dolomite-marble, chlorite-slate, and clay-slate. In the mica-slate *precious garnets* were frequently met with. The members of the transition were principally clay-slate, quartz-rock, and limestone. In some spots alluvial deposits were noticed, together with *brown coal* or lignite.

Moffen Island is small and low, lying on the north side of Spitzbergen, in latitude 80° 1′, longitude 12° 43′ east, and was visited by Mulgrave, who says it had not been noticed by the older navigators. It may be of new formation, and, as Scoresby remarks, has probably been thrown up by the currents which sweep round the principal island. It is of a roundish form, about two miles in diameter, and has a shallow lake in the middle, which was frozen over, except thirty or forty yards round the edge, when visited by the navigator just named, near the end of July. The whole surface is covered with gravel, and possesses not the least vegetation. *It is but a few feet above the level of the sea.* The only piece of drift-wood found on it by his lordship, which was about three

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fathoms long, and as thick as the mizzen-mast of a ship, had been thrown over the sea-beach, and lay near the lake. Captain Parry landed on several islands on the northern coast, viz. *Low Island*, about seven miles long, which appeared composed of transition quartz-rock; *Walden Isle*, on which were observed primitive granites, quartz-rock, and gneiss; and *Ross's Islet*, a remarkable spot, in latitude 80° 48½′, on which he noticed *gray and reddish granite-gneiss, which is very coarse, granular, occasionally porphyritic, with embedded precious garnets, and also a flesh-red variety of the same rock.*

Remarks.—From the preceding details it appears that Spitzbergen and its neighbouring isles afford rocks belonging to five of the great classes admitted by geologists, —namely, primitive, transition, secondary, tertiary, and alluvial. No true volcanic rocks are noticed. Ores are of rare occurrence, small portions of iron-pyrites and of clay ironstone being the only metalliferous substances enumerated. The dolomite-marble of Hecla Cove, mentioned by Parry, agrees in colour, size of grain, and other characters, with the statuary marble of Italy. In these islands the precious garnet is not uncommon. Its occurrence on Ross's Islet, and its known distribution in other countries, shows that the *precious garnet, of all the gems, has the widest geographical range, extending, in the northern hemisphere, from the equator to the high parallel of* 80° 48½′.

Jan Mayen's Island, according to Scoresby, is situated between the latitudes of 70° 49′ and 71° 8′ 20″, and between the longitudes of 7° 26′ and 8° 44′ west. It is about ten leagues long from north-east to south-west, and is in no place above three in breadth. The peak of Beerenberg, the highest of its summits, Scoresby found to be 6870 feet above the sea, consequently higher than any of the summits in Spitzbergen and Greenland. It was seen at the distance of 100 miles. The following account of the geognosy of the only part of the island hitherto examined is given by the same writer; and we

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know it is correct, having in our possession the specimens collected during the excursion :—

"I left the ship," says he, "at three quarters past one in the morning, accompanied by Captains Jackson and Bennet, whose ships were near at the time, and landed at half-past two, amidst a considerable surf, on a beach covered with a coarse black sand. This sand, which formed a very thick bed, covered over an extent of two or three miles, and about a furlong in breadth. It was a mixture of *ironsand*, *augite*, and *olivine* or *chrysolite*. The black parts, which were very heavy, and readily attracted by the magnet, had an appearance exactly like gunpowder. After a few feet rise, forming a seabank of black sand, the strand proceeded inland on a horizontal line for about a fourth of a mile, where it was terminated by irregular cliffs. The strand appeared to have been occasionally covered with the sea, as it was strewed with drift-wood, part of which was tolerably good timber, and the rest bruised and a little worm-eaten. I had not advanced many paces before I observed signs of a volcano. Fragments of *compact* and *vesicular lava* were met with at every step; blocks of burned clay were next met with; and, nearer the cliff, large masses of red clay, partly baked, but still in a friable state, occurred in great abundance. Numerous pointed rocks, probably of the trap formation, were projecting through the sand. One of these, which was *vesicular basalt*, had numerous grains of crystals of augite embedded in it. Along with these was a rock nearly allied in appearance to the celebrated millstone or vesicular basalt of Andernach. After leaving the seashore, I perceived no other mineral but such as bore undoubted marks of recent volcanic action, viz. cinders, earthy slag, burnt clay, scoriæ, vesicular lava. The place from whence these substances appear to have been discharged being near, we attempted to reach it. In performing the ascent, the steepness of the hill and the looseness of the materials made the undertaking not a little arduous. We frequently slid backwards se-

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veral paces by the pieces of lava giving way beneath our feet; in which case the ground generally resounded as if we had been travelling on empty metallic vessels or vaulted caverns. The baked clay, and other loose rocks, consisted chiefly of large masses at the bottom of the hill; but about the middle of the ascent these substances were in smaller fragments. Towards the top, blocks of half-baked red-clay, containing many crystals of augite, were again met with; and about the southern part of the summit, a rugged wall of the same sort occurred, giving the mountain a castellated form of no small magnificence. On reaching this summit, estimated at 1500 feet above the sea, we beheld a beautiful crater, forming a basin of 500 or 600 feet in depth, and 600 or 700 yards in diameter. It was of a circular form, and both the interior and the sides had a similar inclination. The bottom of the crater was filled with alluvial matter to such a height that it presented a horizontal flat of an elliptical form, measuring 400 feet by 240. A subterranean cavern penetrated the side of the crater at the bottom, from whence a spring of water issued, which, after running a short distance towards the south, disappeared in the sand. From this eminence we had a most interesting prospect. Towards the north appeared Beerenberg, now first seen free from clouds, rising in great majesty into the region of perpetual frost. At the foot of the mount, on the south-east side, near a stupendous accumulation of lava, bearing the castellated form, was another crater of similar form to the one described above. Towards the south-west the utmost extent of the island was visible; while towards the north a thick fog obscured the prospect, which, as it advanced in stately grandeur towards us, gradually shrouded the distant scenery, until the nearer mountains were wrapped in impenetrable gloom. The sea at the same time was calm, the sun bright, and the atmosphere of half the hemisphere without a cloud. Excepting the interest excited by the volcano, Beerenberg sunk every other object into comparative insignificance. A rocky hill, with a precipitous side towards the

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sea, lying a little to the westward, I descended towards it from the ridge of the crater, with the expectation of finding some other kind of rock than what had yet been met with. It was found to consist only of a cliff of yellowish-gray friable earth or clay, in which crystals of augite, along with black roundish granular pieces of basalt, lay embedded. A piece of iron, which appeared to have been derived from ironstone by a smelting process conducted in the furnace of nature, was found near the volcanic mount. Being very cumbrous, it was laid aside by our party as we ascended, and unfortunately left behind by us when we quitted the shore. The cliffs here afforded but few specimens of plants. Indeed, we travelled a considerable distance before we could perceive the least sign of vegetation; as we advanced, however, we met with tufts of plants in full flower, scattered widely among the volcanic rocks; but, under the last cliff we visited, the variety was greater and the specimens more vigorous. Among the plants we recognised rumex digynus, saxifraga tricuspidata and oppositifolia, arenaria peploides, silene acaulis, draba verna, &c. We returned to the ships at six in the evening. A fishing-party which I sent out, proving unsuccessful in the offing, approached the shore about two miles to the eastward of the place we visited, where, though the surf was very considerable and the strand very contracted, they effected a landing. They observed much drift-wood, a boat's oar, a ship's mast, and some other wrought wood, scattered along the shore. Every rock they noticed, and all the specimens they brought away, bore the same volcanic character as those I observed. Near some large fissures, which here and there occurred in the rocky and precipitous cliff, immense heaps of lava were seen, which appeared to have been poured out of these chinks in the rock. Cinders, earthy slag, ironsand, and fragments of trap-rocks, covered the beach and so much of the cliff as they had an opportunity of examining. The volcano discovered in this excursion I ventured to name Esk Mount, after the ship I commanded, andt he bay where

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we landed Jameson's Bay, in remembrance of my friend Professor Jameson."

The captain farther remarks, that the volcano on Esk Mount appears to have been in action in the spring of the following year; for, on the 29th of April 1818, being off Jameson's Bay, he observed considerable jets of smoke discharged at intervals from the adjoining land. It was projected with great velocity, and seemed to rise to twice the height of the land, or about 4000 feet. Captain Gilyott, a Greenland fisher, also remarked the same appearance, with this addition, that once he noticed a shining redness resembling the embers of an immense fire. This fact serves to account for some strange noises heard by the seven Dutch seamen who attempted to winter here in the year 1633-4. In the beginning of the night of the 8th of September, in particular, they "were frightened by a noise as if something had fallen very heavy on the ground: but saw nothing." This, instead of being the fall of an iceberg, as some have supposed, was probably a volcanic phenomenon.

3. *Old Greenland.*—This extensive land, which, according to some, is a continuation of the continent of America, while others view it as a group of islands, extends from latitude 59° 14′ to 76° 36′. The few details regarding its geology we owe to Giesecke, who spent many years on the west coast,—to Scoresby, who explored the eastern side,—and to Captain Ross, who at a later period sailed to the top of Baffin's Bay.

East Coast of Greenland.—This iron-bound shore is barren, rugged, and mountainous; and even in the warmer seasons of the year but few animals or vegetables assist in varying the monotonous and dreary scene. The average elevation of the coast is about 3000 feet. Several mountains measured by Scoresby were found to be at least 4000; and the Werner Mountains in Davy Sound were estimated, by the distance at which they were seen and their height above the ordinary mountains, to be not less than 6000. In the interesting

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account of the exploratory voyage performed by a late distinguished officer, Captain Clavering, published in the ninth volume of the New Edinburgh Philosophical Journal, it is stated, that on the coast to the northward of the part surveyed by Scoresby, the mountains are from 3000 to 4000 feet high. The survey made by the latter extended particularly from Cape Barclay and Knighton Bay in about latitude 69°, to Cape Parry in about latitude 72° 30′; that of Captain Clavering from Cape Parry to an island under latitude 76°; and the coast downwards to Cape Farewell, to about latitude 59° 30′, has been partially described by Crantz, but much of it is entirely unknown.

The tract examined by Scoresby appears to consist principally of primitive rock. Secondary ones also occur; the transition are the least frequent; and it was only on the beaches, and at the head of friths, alluvial deposits were noticed.

The primitive rocks were granite, gneiss, mica-slate, hornblende-slate, syenite, and clay-slate. These exhibit in that remote region the same varieties of structure as those on the west coast of Greenland, and the latter again do not differ from the primitive rocks of Britain and other countries; thus affording another proof of the uniformity of their character, similarity of position, and universality of distribution in all parts of the world. Judging from what is known of the embedded minerals on the west coast of Spitzbergen, and reflecting on the agreement of the rocks on both sides of the country, we may infer that if Scoresby had had leisure for more minute investigation, his scientific zeal would have been rewarded by the discovery of the hitherto rare *cryolite*, the *sodalite*, and *allanite*, with magnificent *tourmalines* and *garnets*, interesting varieties of *zircon*, splendid specimens of *hyperstene*, the remarkable *dichroite*, and with all the species of the *felspar* genus. There does not appear any reason why the ores of iron, lead, tin, and copper of the west coast, should not also occur in the same rocks upon the east; and the fine displays of

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apatite, calcareous spar, fluor spar, and of other simple minerals on the west coast, which have been a source of so much instruction and delightful contemplation to the scientific observer, may in some future voyage present themselves in the newly discovered countries to the eye of the naturalist. The specimens of *transition clay-slate* picked up by him prove the existence of rocks of that class in Greenland, and thus add a new feature to its geognosy; for Giesecke does not enumerate any of the slates he met with as belonging to the transition series. This fact is also a farther proof of the wide distribution of these rocks; and shows, in opposition to certain speculative views, that they are not confined to a few narrow corners of the globe, but, like granite and gneiss, may be considered as occurring in most extensive tracts of country, and ought therefore to be associated with the universal formations. We do not know any other examples of these rocks having been found in so high a latitude.

The *secondary rocks* in that country are referable to two formations, one aqueous or Neptunian, the other Plutonic or igneous; the former class belong to the *first secondary sandstone,* or *coal formation,*—the latter to the *secondary trap and porphyry series.* The first does not occur on the west coast, and was met with for the first time in Greenland by Scoresby. It is the same as that which abounds all around Edinburgh; in short, it is that important formation in which are situated all the great coal-mines in Scotland and England. It was seen only in *Jameson's Land,* where it forms the principal deposit, and gives to that district its peculiar characters; thus affording another example of the connexion between the features which distinguish the surface of a country and its geognostical composition. This formation always contains impressions and casts of plants which have a tropical aspect,—a circumstance of high interest, especially when combined with the Arctic situation of the coal. The corresponding formation in Melville Island, in latitude 75°, where the summer

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lasts but a few weeks, I found, on examining a series of specimens, to contain various tropical-looking fossil plants, resembling those in the coal-fields of Britain; and as the same formation occurs in Jameson's Land, in latitude 71°, it is very probable that future naturalists will detect, in its strata, plants of a similar nature. Remains of vegetable substances with tropical characters, evidently in their native place of growth, under the seventy-fifth degree of north latitude, is a fact which naturally leads to very interesting discussions with regard to the ancient forms of the land, the ancient state of the climate, and consequently to the early condition of the animal and vegetable kingdoms of the Arctic regions. The coal formation of Jameson's Land, at *Neill's Cliffs*, exhibits a splendid display of secondary trap-crags, as is so often the case in the middle division of Scotland.

The secondary trap-rocks,—all of which are more or less of an igneous origin, and the consideration of which derives so much importance from the position of the neighbouring strata, the outline of the surface, and the elevation of it above the waters of the ocean,—occur at Traill Island, forming, it should seem, nearly its whole mass. These rocks are principally greenstone, claystone, and felspar porphyries.

Neither Captain Clavering, nor Captain Sabine, who accompanied him, appear to have bestowed any attention on the geology of the country surveyed from Cape Parry to latitude 76°, the most northern point of Greenland seen by the first of these officers, as all we obtain from their reports is simply, that it was mountainous, from 3000 to 4000 feet high, and principally composed of trap-rocks.

West Coast of Greenland.—The west coast of this forlorn region is equally mountainous, rugged, and desolate as the eastern. The country, even when but inconsiderably elevated above the sea, is covered with snow, or encased in ice. In the warm season of the year *rivers* appear, but they are few in number and of

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no great size, being supplied solely by the melting of the snow. The same also is the case with the *lakes*, which are, however, in some parts of considerable extent. *Springs* then also burst forth, but in winter the greater number cease. Giesecke mentions one which rises and falls with the tide; and a *hot spring*, which, interrupted neither by cold nor storm, flows all the year round with a temperature of 104° of Fahrenheit. It occurs in the island of Ounartok, in latitude 60°, and is highly interesting, as showing that the volcanic agency, which was formerly exerted so extensively in this country, is still at work beneath the surface.*

The large islands that skirt this coast, of which the most considerable is *Disco*, are, like the continent, composed of barren rocks, and of valleys filled with eternal ice; while the smaller ones are formed of roundish elevations and hills usually inhabited by numberless seafowl.

The little we know of the geology has been obtained by examining the coast, or tracts removed but a short distance from it,—the interior and higher parts of the country being inaccessible, owing to the deep and constant cover of snow.

Four classes of rocks occur, viz. primitive, secondary, tertiary, and alluvial. The *primitive Neptunian rocks* are, some granites, gneiss, mica-slate, whitestone, clay-slate, greenstone, and limestone; the *primitive igneous rocks* are granite and porphyry. These rocks exhibit the usual relations, the gneiss appearing as the under or fundamental rock, supporting the whitestone, mica-slate, and clay-slate, with their limestones and greenstones; while certain granites, syenite, and porphyry, rise through the older or Neptunian rocks. In these last various beautiful and curious minerals occur; namely,

* The experiments of Cordier, related in the New Edinburgh Philosophical Journal, with the numerous details in regard to the temperature of springs and mines, go to support the idea, not of a *central heat*, but of a source of heat independent of that derived from the sun, situated in the *crust of the earth*.

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cryolite, allanite, sodalite, thulite; also numerous *precious garnets, rock-crystal, rose-quartz, dichroite, hyperstene, apatite* or phosphate of lime, *zircon, fluor-spar, calc-spar, gold-like mica, magnetic iron-ore, gadolonite, tinstone, wolfram, arsenical* and *iron pyrites, galena* or leadglance, *titanium,* and others. Indurated talc and potstone are also found, and sometimes converted into lamps and kettles. Utensils made of these minerals are carried to a distance and bartered for provisions, furs, and other commodities. The Greenlanders, says Crantz, occasionally give them as presents to persons of distinction in Denmark, where they are highly valued, as it is thought that certain kinds of food prepared in them are more delicate than when done in metallic vessels. It may also be noticed, that the gold-like variety of mica was at one time taken for gold itself; and it is stated by Egede, that its appearance was so seducing that two successive expeditions were sent from Denmark in the early part of the 17th century for cargoes of it, which, after the most careful analysis, were found worthless.

The *secondary* and *tertiary rocks,* at present known to occur on this coast, are traps, with slate-clay, limestone containing fishes, and limestone having in it portions of embedded *amber.* These calcareous deposits and slate are associated with beds of brown coal, in some kinds of which *amber* also occurs. These newer trap-rocks—the amygdaloidal,—varieties of which contain agate, jasper, calcedony, and green earth, have been traced from latitude 69° 14′ to the top of Baffin's Bay, the farthest point reached by Captain Ross.* Fine specimens of these are seen in the large island named *Disco,* which is entirely formed of them. The *alluvial* depositions, which are of sand, gravel, clay, and rolled masses, occur on the seashore, or on the sides of the fiords; but they seem not to appear any where in great quantity. *Peat,* which is to be considered an alluvial formation, is

* Considerable masses of *meteoric iron* were found by Captain Ross at Sowallock Point, in latitude 76° 2′.

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met with in fenny places, interspersed with roots, branches, decayed wood, and withered grass. Much of it contains sea-shells, from which it is suspected that it must have been covered by the ocean at some distant period. No *wood grows;* but *drift-wood* is frequently obtained on the coasts, particularly in the southern and western parts.

4. *Barrow's Strait, Melville Island, Port Bowen.*—All that is known of the geology of these Arctic lands we owe to the several expeditions which sailed under the direction of Captain Parry between the years 1819 and 1823.

The east side of Baffin's Bay or west coast of Greenland, as already mentioned, is composed principally of primitive and secondary rocks. On the west side of the same bay, to the entrance of Lancaster Sound, the predominating rocks were found to be gneiss, mica-slate, and granite. At the entrance of that Sound and in Possession Bay, there are granite, syenite, and hornblende, with precious garnets disseminated in them, and rocks of new red sandstone, with fibrous and granular gypsum. The north coast of Barrow's Strait, as far westward as the Polar Sea, is said to consist of calcareous strata resembling mountain-limestone. Both sides of Prince Regent's Inlet are formed of a compact limestone, which contains fibrous brown iron-ore and a kind of lignite. Its colours are ash-gray, yellowish-gray, and yellowish-brown. It affords about 20 per cent. of carbonate of magnesia, and is therefore a magnesian limestone. It contains embedded masses of *chert-quartz*. The organic remains found in it were *entrochites, cati-nularia, speropore, turbinoliæ, favosites,* several species of *terebratulæ,* a *trochus,* a *turritella,* and an *orthoceratite.* This has been called *Port Bowen limestone;* its age has not been determined. Resting upon it there are thick beds of gypsum, containing selenitic, fibrous, and foliated varieties, which are connected with a slaty limestone, which is newer than that of Port Bowen. Byam Martin's Island appears to be composed of granite

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and red-coloured quartz-rock. A fossil dicotyledonous tree was found on the shore of this island. Melville Island is the most western point ever navigated in the Polar Sea from the eastern entrance. It lies in latitude 74° 26′ north, and longitude 113° 46′ west. Its length is one hundred and thirty-five miles from east-north-east to south-south-west; its breadth forty or fifty miles. Granite, gneiss, and syenite were found in the vicinity of Winter Harbour; but the principal formations, as far as the specimens brought home allowed us to infer, appear to be *transition glancecoal*, and the *first, or oldest secondary coal formations*. The rocks of these formations observed there were the following:—White quartz-rock, sometimes micaceous, containing impressions of *trilobites*, belonging to the genus *asaphus;* sandstone, containing *trochi*, or joints of the stem of the *encrinus;* —but the most frequent fossils in the sandstone were vegetable casts and impressions of species in some measure characteristic of the coal-sandstone, particularly *arborescent ferns*, resembling those which at present occur only in the tropical regions of the earth. *Slate-clay* and *clay-ironstone* were also found associated with the coal-sandstone; one specimen of ironstone was found to contain a fossil *avicula*, named by König, *Melvilliana*, in honour of Lord Melville. The secondary *coal* is more or less of a slaty structure; its colour is of a brownish-black. It emits no unpleasant smell when burning, and leaves copious grayish-white-coloured ashes. It is quite a different coal from the brown variety of Disco, which contains amber. It would appear that the trilobite, or glancecoal, is connected with quartz-rock, while the secondary coal rests upon a limestone resembling the mountain-limestone, containing bivalve shells and coral-lines, a species of terebratula, and the *Favosites Gothlandicus*. These deposits appear to be traversed by whin-dikes or trap-veins.

5. *Islands and Countries bordering on Hudson's Bay, examined and partly discovered by Captain Parry.*— The lands, including Melville Peninsula, Vansittart

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Island, Baffin Island, Winter Island, Cockburn Island, and Southampton Island, are not very much elevated above the level of the sea,—the average height being 800 feet, and the highest summits not exceeding 1500. The valleys are narrow and rugged, and the cliffs sometimes display mural precipices of more than 100 feet high. The country is covered with ice and snow the greater part of the year, often exhibiting the most splendid iridescences, and forms of the most picturesque description. The upper soil varies from a few inches to a foot in depth, beneath which the ground is frozen throughout the whole twelve months. The rocks of which this country is composed vary in their nature; the primitive predominating in some places, in others those of the transition, or of the secondary classes; no tertiary ones were met with, nor formations either of the ancient or modern volcanic periods. The primitive rocks enumerated and described are the following:—*Granite*, gneiss, mica-slate, clay-slate, chlorite-slate, primitive trap, serpentine, limestone, and porphyry. In these occur several interesting minerals, as the gems named *zircon* and *beryl*, also *precious garnet*, *actynolite*, *tremolite*, *diallage*, *coccolite*, *rock-crystal*, *calc-spar*, *rhomb-spar*, *asbestus*, *graphite* or *black-lead*, *specular iron-ore*, *magnetic iron-ore*, *chrome-ore* or *chromate of iron*, *titanitic iron*, *common and magnetic iron-pyrites*. The transition are quartz-rock, old red sandstone or red graywacke, common graywacke, and flinty slate; containing *felspar*, *mica*, *chlorite*, *pale rose-quartz*, *epidote*, *rock-crystal*, *shorl*, *molybdena*, *ironglance*, *magnetic iron-ore*, *copper-pyrites*, and *iron-pyrites*.

Of the secondary rocks, the only kinds observed were limestone, bituminous shale, and greenstone. No fossil organic remains were detected in any of this series but the limestone, which afforded two genera of corals, the *caryophyllea* and *astrea*; one crustaceous animal of the trilobite genus; a *productus*, a *terebratula*, and species of the genera *nautilus*, *trochus*, and *orthocæras*. No extensive deposits of alluvial matters were observed,

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and the most striking objects are the rolled masses or boulders. Some islands, entirely composed of limestone, were strewed over with these fragments, often very large, of gneiss, granite, and quartz, although no hills composed of them were within some hundred miles.

CONCLUDING REMARKS.

THE observations made in Cherie Island, Jan Mayen's Island, Spitzbergen, Old Greenland, and the various lands explored by Captains Ross and Parry, supply the following facts and inferences :—

1. That those miserable and almost uninhabited regions abound in primitive and transition rocks ; and that although secondary rocks occupy considerable tracts, still, as far as is known at present, their extent is more limited than that of the older formations ; that the alluvial deposits are not extensive ; that modern volcanic rocks occur only in Jan Mayen's Island ; and that the only traces of tertiary strata were found in the sandstones, clays, and limestones, connected with the new trap-rocks in Baffin's Bay.

2. That the primitive and transition rocks of Neptunian origin, now forming islands of various magnitudes, were in all probability at one time connected together, and formed a more continuous mass of land than at present ; and that on these formations were deposited the secondary limestones, sandstones, gypsum, and coal, and upon these again the tertiary rocks, and the still newer *shell-clay* of Spitzbergen : That these various kinds of primary, transition, secondary, and tertiary rocks, and alluvial clays, were raised above the level of the sea at different times through volcanic agency.

3. That in the course of time the land was broken up —either suddenly or by degrees, or partly by violent action, and partly by the long-continued agency of the atmosphere and the ocean—into its present insular form ; and that, consequently, the secondary and ter-

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tiary formations in these regions were formerly more extensively distributed than at present.

4. That previously to the deposition of the coal formation, as in Melville Island and Jameson's Land, the older hills supported a vegetation resembling that which at present characterizes the warmest regions of the globe. The fossil corals in the limestones—corals of which the prototypes are at present met with in the hot seas of the tropical regions—also intimate that, before, during, and after the deposition of the coal formation, the waters of the Arctic Ocean were so constituted as to support polyparia, or corals, resembling those of the present equatorial seas.

5. That probably the climate of the Arctic regions in ancient times was connected in some degree with the magnitude and form of the land, and its relations to the extent and height of other countries.

6. That the boulders or rolled blocks observed in different quarters, and in tracts distant from their original localities, afford evidence of the passage of water across them, and at a period subsequent to the deposition of the newest Neptunian strata.

7. That possibly the distribution of these blocks or boulders was occasioned by the agitations in the ocean, caused by the upraising of certain lands.

8. That the black or common coal, that namely of the old formation, which some speculators maintain to be confined to the more temperate regions of the earth, is now proved,—by its discovery by Parry in Melville Island far to the west, and by Scoresby on the eastern shores of Greenland,—to form an interesting feature in the geognostical constitution of Arctic countries.

9. That the new red sandstone and gypsum found in certain tracts allow us to infer that they contain *rock-salt*.

10. That although few new metalliferous specimens have been produced to gratify the curiosity of the mineralogist, yet the previous details show that valuable

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ores of iron, copper, lead, and tin, and also graphite, or black-lead, are not uncommon.

11. That the gems, the most valued and beautiful of mineral substances, are not wanting in the Arctic regions, as is proved by the occurrence of precious garnets, beryls, zircons, dichroites, and rock-crystals.

12. That the islands and lands described in this sketch exhibit the same geognostical arrangements as occur in all other extensive tracts of country hitherto examined by the naturalist,—a fact which strengthens the opinion that the *grand features* of nature in the mineral kingdom are every where similar, and, consequently, that the same general agencies must have prevailed during the formation of the different groups of rocks of which the earth is composed.

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